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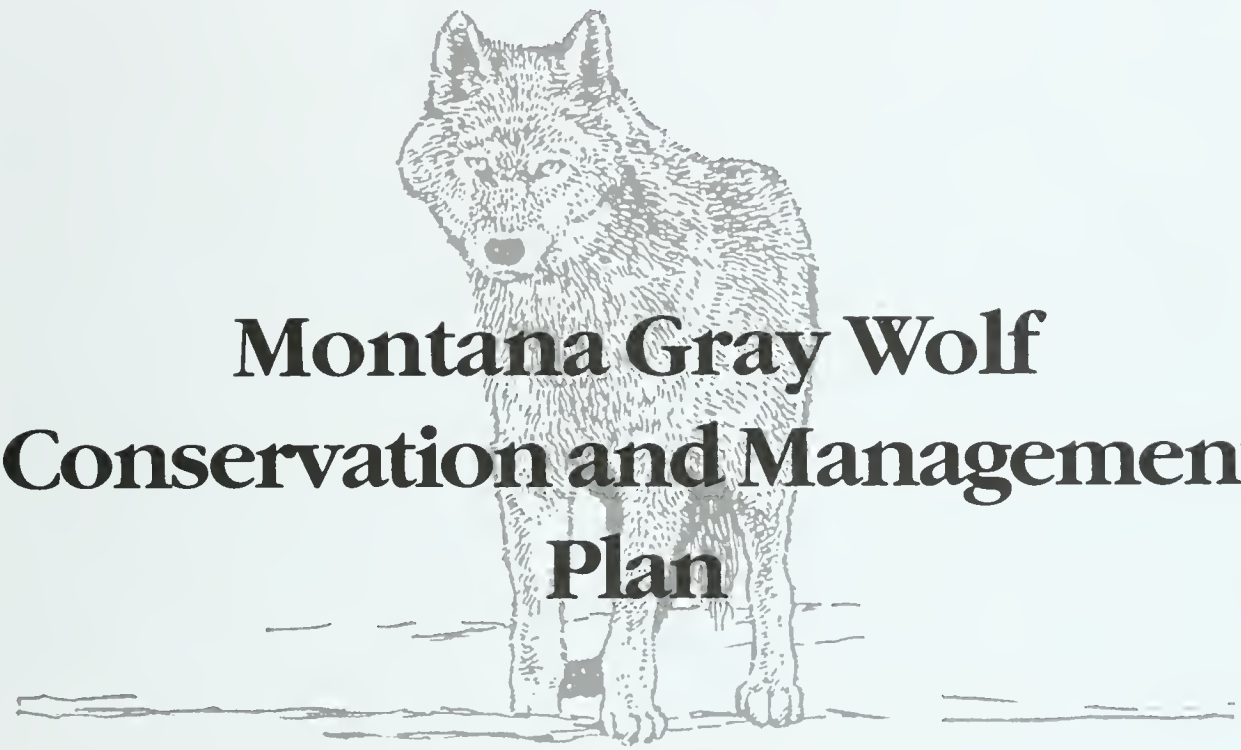

Montana Gray Wolf Conservation and Management Plan

March 2003

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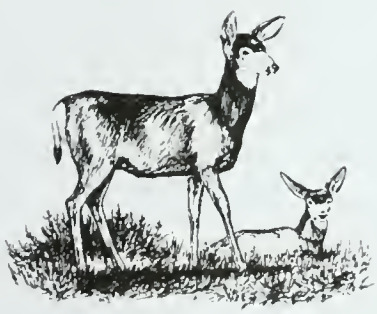

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Montana Fish, Wildlife & Parks

P.O. Box 200701
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(406) 444-3186
FAX: 406-444-4952
Ref: DO0127-03
March 10, 2003

Dear Interested Party:

This draft environmental impact statement (EIS) has been prepared by Montana Fish, Wildlife & Parks. The EIS describes five alternative approaches to conserve and manage Montana's recovered gray wolf population. It also evaluates the expected environmental consequences of each alternative.

In anticipation of the wolf's recovery, former Gov. Marc Racicot appointed the 12-member Wolf Management Advisory Council to consider a wolf management approach for Montana to follow once the wolf is delisted. After months of public deliberations over a wide range of issues, the council submitted its findings to Gov. Judy Martz in 2001. This draft EIS was prepared in response to the council's recommendations and is in part based on the group's suggested approach to wolf management in Montana. On behalf of the people of Montana, FWP once again thanks the members of the Wolf Management Advisory Council for their commitment to this important wildlife conservation and management effort.

FWP looks forward to hearing from you about this important issue. You can send your written comments to Wolf Issues, FWP, 490 N. Meridian Rd., Kalispell, MT 59901. You can comment on-line by visiting FWP's website at www.fwp.state.mt.us. Click on "Montana Wolf Management" in the Hot Topics box and then click on the "Comments" link. We also look forward to working with you at one of the following community work sessions.

March 27: Billings	***April 8***: Missoula	***April 16***: Dillon	***April 21***: Great Falls
April 1: Glasgow	***April 14***: Bozeman	***April 16***: Butte	***April 23***: Kalispell, Whitefish
April 3: Avon	***April 15***: Gardiner	***April 17***: Ennis	***April 24***: Rexford

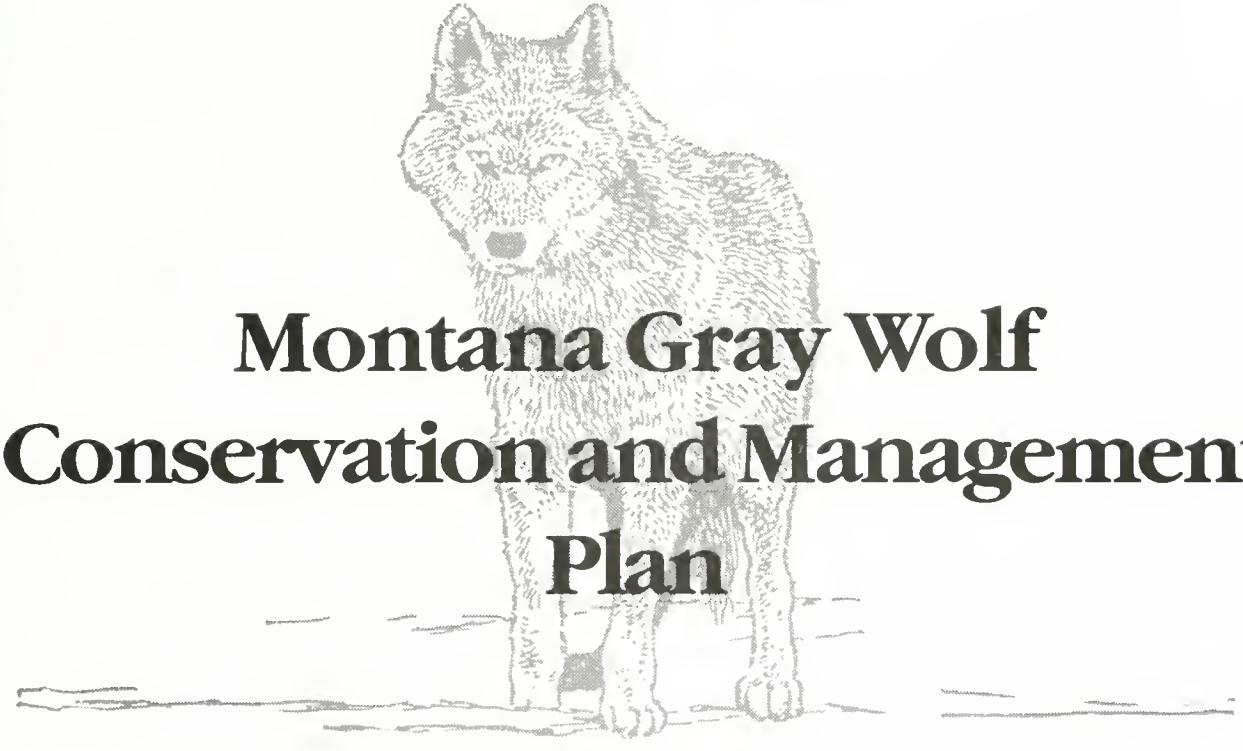
Additional information may be obtained from our website www.fwp.state.mt.us or by contacting Carolyn Sime at 406-751-4586. The public comment period will close May 12, 2003.

Sincerely,

M. Jeff Hagener

M. Jeff Hagener
Director

DRAFT
Environmental Impact Statement



Montana Gray Wolf Conservation and Management Plan

March 2003

Montana Fish, Wildlife & Parks

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CHAPTER 1: PURPOSE AND NEED FOR ACTION

Introduction

Gray wolves (*Canis lupus*) are thriving and expanding in number and distribution in Montana. This is because of natural emigration from Canada and a successful federal effort that reintroduced wolves into Yellowstone National Park (YNP) and the wilderness areas of central Idaho. There are probably more wild wolves in Montana now than at any time in the past 70 years. Since 1974, the U.S. Fish and Wildlife Service (USFWS) has managed wolves in Montana, under the authority of the Endangered Species Act (ESA). The biological recovery goal for the northern Rockies wolf population is a total of 30 or more breeding pairs for three years in the states of Montana, Idaho, and Wyoming, with breeding pair being defined as a male and a female that raised at least two pups to December 31. The biological requirements for recovery were met at the end of 2002.

But before USFWS will propose to delist, federal managers must be confident that a secure, viable population of gray wolves will persist if the protections of the ESA are removed. To provide that assurance, Montana, Idaho, and Wyoming must develop conservation and management plans and adopt other regulatory mechanisms in state law. Upon review and approval of the state plans, USFWS will propose to delist the gray wolf. Upon delisting, management authority for wolves will return to the state governments where wolves reside.

Purpose and Need for the Proposed Action

USFWS has managed wolves in Montana as either "endangered" or as "experimental, nonessential" under the authority of ESA. Montana Fish, Wildlife & Parks (FWP) proposes to prepare and adopt a wolf conservation and management plan so that management authority can be transferred to the State of Montana when the biological recovery goal is met. If Idaho, Wyoming and Montana do not develop and adopt conservation and management plans, which in combination must assure the long-term security of wolves in the northern Rockies, USFWS will not delist the gray wolf. In that case, wolves in Montana will continue to be managed by the federal government.

USFWS anticipates the delisting process could begin in 2003, if wolf management plans are completed by the three states. The State of Montana would adopt a wolf conservation and management plan prior to USFWS's proposal to delist wolves, but the plan would not be implemented until USFWS officially transfers legal authority to the state. Under Montana statute, FWP is the agency charged with conservation and management of resident wildlife.

FWP recognizes the gray wolf as a native species and is committed to recovery of the species within Montana. The purpose of the plan is to manage wolves consistent with Montana's own state laws, policies, rules, and regulations. FWP intends to implement positive conservation and management strategies to make sure that all federal requirements are met, recovery is complete, and that wolves are integrated as a valuable part of Montana's wildlife heritage.

FWP also recognizes that the long-term future of wolves in Montana depends on carefully balancing the complex biological, social, economic, and political aspects of wolf management. FWP will consider the wide spectrum of interests in designing and implementing a flexible program that is responsive and addresses the challenges faced by people directly affected by wolves.

Benefits of the Proposed Action

Managing gray wolves as a resident native species according to state guidelines will allow the program to be more flexible and adaptable in meeting the needs and interests of Montana citizens and visitors. Montana's legal requirement to maintain a secure population of wolves in the northern Rockies in conjunction with Idaho and Wyoming would be met by developing and adopting a program. Managing gray wolves will not be easy, but wolf restoration is fundamentally consistent with Montana's history of wildlife conservation. FWP believes that it is in Montana's best interest to recognize and take on the challenges, responsibilities, and benefits of a restored wolf population.

Decisions to be Made

FWP is using the Montana Environmental Policy Act (MEPA) as a tool to decide if the state will assume management responsibility. The process of preparing an Environmental Impact Statement (EIS) requires FWP to decide how wolves will be managed if it assumes responsibility. One alternative suggests that FWP neither prepares nor adopts a plan. Other alternatives suggest that FWP develops a plan and go on to describe conservation and management activities that would be implemented under each alternative. The alternatives describe a spectrum of philosophies, strategies, and tools from which FWP will ultimately determine a course of action.

If FWP selects an alternative that describes a wolf program implemented by FWP, the alternative will become FWP's management plan. That plan will address wolf conservation and management anywhere wolves occur in Montana, except where management authority is otherwise explicitly reserved to other jurisdictions, such as Montana's Indian tribes. Ultimately, the outcome of this EIS process will result in a management and conservation plan which would be implemented through the combined decisions and actions of the FWP Commission, the seven FWP administrative regional offices, FWP's headquarters in Helena, the Montana Department of Livestock (MDOL), USDA Wildlife Services (WS), local law enforcement or county authorities, and other cooperators.

Other Agencies that have Jurisdiction or Responsibility

At present, USFWS and WS are responsible for wolf recovery and management activities. Federal laws, rules and regulations provide guidance. When wolves are delisted and management authority is transferred to the State of Montana, state laws become the primary regulatory and legal mechanisms guiding management. Two titles within Montana statutes describe the legal status and management framework for wolves. Title 87 pertains to fish and wildlife species and oversight by FWP. Title 81 pertains to the MDOL and its responsibilities related to predator control. Montana statutes assign joint responsibility to FWP and MDOL for managing wildlife that causes property damage to livestock. Through a cooperative agreement with MDOL, WS conducts field investigations and management activities in cases of property damage caused by wildlife such as mountain lions, bears, coyotes, and now potentially gray wolves.

Outfitters in Montana are under the jurisdiction of the Montana Board of Outfitters and the Montana Department of Commerce, which is responsible for issuing outfitting licenses and the enforcement of laws regulating the outfitting industry. Outfitters using federal lands are also overseen by the respective federal land management agencies.

The U.S. Forest Service (USFS), the National Park Service (NPS), the Bureau of Land Management, USFWS, or other federal jurisdictions administer federally owned lands. These agencies manage these lands according to their enabling legislation and relevant federal laws, rules, and regulations. FWP

coordinates with federal agencies on wildlife and habitat issues of mutual interest, but has no jurisdiction over how those lands are managed. Both the USFWS and state agencies have authorities and responsibilities for wildlife management on national wildlife refuges. NPS also has jurisdiction over wildlife within national parks.

Montana's Indian tribes have jurisdictional authority for wildlife conservation and management programs within reservation boundaries. FWP coordinates with tribal authorities on issues of mutual interest.

Public Involvement Process

Although wolves have been documented in Montana intermittently since the 1950s, recovery in the sense of a breeding population in Montana actually began about 17 years ago when the first Rocky Mountain gray wolves in more than 50 years denned in Glacier National Park. Then, in 1995 and 1996, a total of 66 wolves from southwestern Canada were reintroduced to Yellowstone National Park and central Idaho.

Montana's effort to take over this endangered species upon its recovery began in 1994 when FWP solicited public comments on the agency taking a more active role during the recovery phase. That effort resulted in the 1995 draft Wolf Recovery and Management Plan. That plan was not implemented, primarily because of uncertainties about funding and agency responsibilities. Then, five years later, the effort hit full stride when Gov. Marc Racicot convened Montana's Wolf Management Advisory Council.

The 12-member Wolf Management Advisory Council—a mix of livestock producers, hunters, educators, outfitters, conservationists, and other citizens—worked for seven months to develop 26 "Guiding Principles" organized in four broad subject areas that address the public interest, public safety, maintaining wildlife populations and protecting the livestock industry. An Interagency Technical Committee advised the council, providing scientifically based information about biological, technical, legal, or financial aspects of wolf conservation and management. The Technical Committee also helped the council identify and assess challenges associated with implementing overall management strategies or specific management actions. It was comprised of wolf experts and resource managers from the National Park Service, USFWS, U.S. Forest Service, Wildlife Services, and FWP.

The council delivered its report and recommendations to Gov. Racicot, and then governor-elect Judy Martz, in early 2001. Based on its public deliberations, the council reported that the State of Montana could contribute to wolf recovery in the northern Rockies. Furthermore, the council reported that, once recovered, wolves can coexist within Montana's complex biological, social, economic, and political landscape and that it is appropriate for FWP to develop a management program.

More specifically, the advisory council recommended that Montana:

- maintain wolf populations at levels that will prevent reclassification as "threatened" or "endangered" under federal law.
- encourage wolves to inhabit large, contiguous public-land areas where the potential for conflict is lowest.
- integrate wolf and wildlife management to maintain traditional hunting heritage and wildlife viewing opportunities.
- incorporate public outreach and encourage Native American cooperation.

- share funding among state, federal, and private entities.
- act upon threatening wolf-human encounters consistent with black bear and mountain lion management guidelines.
- enhance deer and elk populations to support wolf populations, maintain recreational and viewing opportunities, and reduce the potential for livestock depredation.
- use hunting and trapping to manage increasing wolf numbers in a manner that will sustain wolf populations and preclude reclassification under federal law.
- recognize that tolerance for wolves on private property is fundamental to wolf population recovery and range expansion.
- compensate livestock owners for losses at fair market value but do not use FWP funds to compensate depredation losses.
- provide incentives to livestock producers who use best management practices to decrease wolf/livestock conflicts.
- allow livestock owners to address wolf depredation problems on private lands as wolf numbers increase.
- use wolf numbers to address the management of wolf depredations on livestock. When wolf numbers are low, more conservative methods should be applied; more aggressive control methods should be applied as wolf numbers increase.

At the end of 2000, FWP officials characterized the advisory council's report as the first step toward acquiring wolf management responsibilities from the federal government. The group's work was aimed directly at helping to determine how to balance wolf numbers with the deer and elk they prey upon, address conflicts with livestock operations, ensure human safety, and how Montana's wolf management responsibilities should be funded.

With the advisory council's report in hand, Gov. Judy Martz directed FWP to use it to frame a wolf management plan. In response, FWP released the "Montana Wolf Conservation and Management Planning Document" in January 2002 (Appendix 1). While the 117-page planning document reflected what a state wolf management plan could resemble if it were based on the council's work and recommendations, FWP still needed to hear from others and explore various alternatives before adopting a management plan in full compliance with the legal requirements of MEPA.

In January 2002, FWP mailed about 1,000 post cards announcing: (1) the completion of the Montana Wolf Conservation and Management Planning Document; and (2) that an environmental review process was set to began. Many more announcements were sent via E-mail, while other citizens were alerted through FWP news releases and by visiting FWP's website www.fwp.state.mt.us.

Using this document as a basis for discussion, FWP opened the "scoping" comment period for its wolf management EIS on Feb. 25, 2002 by asking the public to identify issues and concerns about a state-sponsored wolf management program. The public was invited to provide comments to FWP directly at a series of community work sessions held throughout the state in March-April 2002. In addition, FWP invited the public to submit comments in writing or electronically.

Media coverage of the community work sessions, and the public's other opportunities to comment, was extensive. More than 800 people participated by attending a work session, and thousands wrote comments or sent emails, representing nearly every Montana county. In addition, comments came from 49 states, including the District of Columbia and Puerto Rico; and eight foreign countries, including Australia, Canada, Denmark, Germany, Israel, Mexico and the United Kingdom. Although MEPA requires at least 30 days for an EIS "scoping" period, FWP designed a 60-day process to ensure that the public had adequate time to consider this important issue. The first public comment phase of Montana's process to develop and adopt a wolf management plan closed April 30, 2002.

In all, FWP collected nearly 4,000 comments and written correspondences. Because many of the written letters and E-mails identified more than one issue or concern, FWP recorded nearly 6,700 individual comments. Upon review of the process, the comments, and the worldwide attention paid to this issue, FWP Director Jeff Hagener said Montana's effort to manage wolves will ultimately result in a groundbreaking wildlife management plan.

Because wolf recovery and the potential for the state to regain management authority are issues of such great significance to Montana, Governor Martz reappointed the original Wolf Management Advisory Council in January 2003. Their charge is to assist FWP through the final stages of state planning efforts and completion of this EIS process. After FWP completely analyzes the public comments received on the alternatives presented in this draft EIS, it will consult with the Wolf Management Advisory Council and the FWP Commission. FWP will then select a final alternative – one that was presented in the draft EIS, one that is a combination of alternatives presented in the draft, or a new one that is generated through public comment and for which a foundation already exists in the draft EIS.

Next, FWP will prepare a final EIS that includes a summary of the major conclusions and supporting information from the draft EIS and the agency's responses to substantive public comments received on the draft. The final EIS will also disclose the agency's recommendation, or proposed decision, with an explanation of the reasons. FWP will also prepare a Record of Decision (ROD), sometimes called a decision document, which is a concise public notice that announces the decision, explains the reasons for the decision, and explains any special conditions surrounding the decision or its implementation. The ROD could be a separate document from the final EIS. Ultimately, the ROD and the final EIS will comprise Montana's official plan to manage a fully recovered endangered species – a plan that was largely crafted by the public.

Issues Identified through Public Scoping and Evaluated in the EIS

The Montana Wolf Management Advisory Council identified roughly 30 issues during its deliberations in 2000. During the 2002 scoping process, FWP asked Montanans to identify issues in a similar manner. Comments received during the public scoping period (community work sessions, written letters and postcards, and E-mail correspondence) were entered into a computer database for systematic analysis. There was a significant degree of overlap between the council's list and the list of issues generated by the public. In fact, many public comments supported the work of the council and agreed with its recommendations.

Through the analysis, broad themes emerged. They encompassed issues, questions, and concerns about wolf management, wolf numbers, wolf distribution, state and federal administration, predator and prey relationships, program funding and various considerations for human health and safety, livestock, wildlife habitat, land management, and more. With a full spectrum of comments associated with each issue, FWP often received conflicting public comments. For instance, some comments directly opposed one another

and are thus irreconcilable. Nonetheless, opposing points-of-view are incorporated in the EIS. The fundamental issues of wolf conservation and management, associated social factors, state and federal administrative responsibilities, prey populations and their management, and concerns about livestock and compensation for wolf-caused losses were significant enough to drive the creation of specific alternatives. The lack of strongly conflicting public comments on issues like human safety, the need for information outreach and education, or wolf population monitoring for example, allowed FWP to address several issues in different ways within the spectrum of alternatives created based on the major issues.
The intent of a scoping period is for the agency to gather information from the public. Thus, the community work sessions were not designed to answer questions or to provide specific information on what would be in Montana's plan. Nonetheless, many questions emerged which can also be a measure of public concerns and issues. A separate summary, which FWP will use to address specific needs and target future public outreach efforts, captures the questions raised during the scoping period. While some questions can be answered directly, others are rhetorical, beyond the scope of the EIS, or beyond the jurisdiction of FWP. Many questions, however, can only be answered through the development of this EIS and the final decision.

The following is a comprehensive list of issues addressed in this EIS. See Table 1.

Wolf Management, Numbers, Distribution, and Conservation Strategies. These public comments describe many different philosophies, tools, and strategies for how wolves could be managed; comments also address how many wolves would be in the Montana population and where they will be distributed. Wolves were managed as a bounty animal up until about 70 years ago when they were thought to be extinct in Montana. Wolves in Montana became protected as an endangered species in the early 1970s.

Social Factors: These comments reflect the differing philosophical, value-based opinions, and the human dimensions surrounding wolves, wolf management, prey populations, etc. The social, cultural, and aesthetic values people assign to the gray wolf today grow out of a long, colorful history of interactions between wolves and people. Public opinions about wolves vary greatly. A successful conservation and management program for wolves ultimately depends on people and their attitudes. The social factors that shape public interest in or tolerance for wolf presence and how conflicts are resolved are equally important components of any wolf management program.

Administration and Delisting. These comments address state and federal responsibilities, the current legal status of wolves, their recovery, the federal and state delisting processes and the progress of planning efforts in Idaho and Wyoming. While the restoration of wolves in Montana occurred through the combination of natural wolf recolonization and reintroduction, the population in the tri-state area has attained the biological benchmarks of species recovery. The question at hand is how a recovered wolf population will be managed and by what agency or jurisdiction. Many comments also identified concerns about potential delays in delisting due the lack of adequate regulatory mechanisms and/or management plans in Idaho or Wyoming or litigation, which would delay or block transfer of management authority to Montana.

Prey Populations. These comments address wolf-prey interactions, potential impacts of wolf predation on Montana big game populations, how wolves and ungulates will be managed, how other predators and other wildlife will be managed, and Montana's hunting heritage. Because of their long-term financial investments and willingness to restrict themselves when necessary, Montanans enjoy relatively liberal hunting seasons for more ungulate species than other western states. The financial investments and sacrifices made by the hunting public to restore ungulate populations are significant.

Funding. These comments address wolf management costs, sources of funding, and the reliability of funding in the future. FWP has actively restored, perpetuated, and managed the fish and wildlife

resources of the state using the fees generated through the sale of hunting and fishing licenses and matching federal monies. As there was disagreement about the recovery of the gray wolf, a long-absent native species, there are also different opinions about how future wolf conservation and management activities should be funded.

Livestock. These comments address Montana's livestock industry, its importance and responsibilities, and what actions government officials and private citizens would take when wolves kill livestock. Wolves can cause problems for some livestock producers. Financial losses may result directly from wolf depredation. Indirect costs may accumulate because of increased management activities, changes in husbandry practices, or unconfirmed losses. These financial hardships accrue to individual farmers and ranchers and may be significant to them.

Wolf Habitat, Habitat Connectivity, and Land Management. These comments address the need for wolves to move freely through Montana, within the tri-state area, and across the international border and question how and where this will be accomplished. During the recovery phase, connectivity of the wolf population in the northern Rockies with the Canadian population was assured through federal legal protections, adequate prey populations, and the network of public lands--all of which facilitate dispersal and maintenance of genetic viability, an important underpinning of recovery and long-term security of a recovered population. Montana is an important link between Yellowstone, Idaho, and Canadian sub-populations. Interagency coordination and monitoring programs must assure that regional connectivity is maintained through adequate dispersal. Comments also address whether or not there is a need for motorized travel restrictions or localized area closures where wolf packs establish den or rendezvous sites.

Compensation. These comments address payments to livestock producers and others who experience wolf depredation losses; comments also address the source and reliability of the funding and how a compensation program would be administered. Wolf population recovery has and will continue to result in the loss of personal property or income to some individuals due to wolf activity and depredation.

Economics/Livelihoods. These comments address the economic costs and benefits of having wolves in Montana, livelihoods, ecotourism, and fiscal impacts to FWP.

Information, Education, and Public Outreach. These comments address the need for FWP to develop information and education techniques and programs to keep Montanans informed about wolf conservation, wolf management, and human safety. Comments also address the need for technical assistance for landowners and other rural residents. The long-term status of gray wolf populations will be determined by human attitudes toward wolves.

Human Safety. These comments identify Montanans' concerns about the safety of their children, pets, and their livestock in the presence of a recovered wolf population. Generally, wolves fear people and do not pose a significant threat to human safety. However, individual wolves may gradually lose their fear of people and begin associating or interacting with people and/or loitering near buildings, livestock, or domestic dogs. While this behavior is unusual for a wild wolf, it is more typical of a released captive wolf or wolf-dog hybrid. Habituation of wild wolves has been identified as a contributing factor in aggressive wolf-human encounters (McNay 2002b).

Monitoring. These comments address how and at what intensity wildlife managers will monitor wolf populations, pack sizes, pack locations, locations of individual wolves, and the status of prey populations. During the first five years after delisting, FWP must document that the Montana sub-population of wolves is secure and that the combined total of wolves in Montana, Idaho, and Wyoming exceeds the delisting threshold.

Other Wildlife. These comments address wolf interactions with other, non-ungulate wildlife species (e.g. ESA-listed species, other carnivores). Wolves could function as "keystone species" which exist at relatively low abundance, whose effect on the ecosystem is relatively large and involves multiple trophic levels (Power et al. 1996, Estes 1996). A wide variety of scavengers and other carnivores benefit from the year-round availability of carrion. Wolves may directly or indirectly compete for food with other carnivores by selecting similar prey or by usurping kills (Kunkel et al. 1999). Some non-ungulate species, such as the beaver, are also prey items for the gray wolf in Montana.

Private Property. These comments address "private property rights", referring to wolf presence on private property, protection of private property, etc. Some comments assert a landowner's "right" to allow wolves on his or her property, while others assert a landowner's "right" to control or manage wolves on his or her property. While wildlife are publicly owned resources and managed in trust for this and future generations of Montanans, perpetuation of Montana's wildlife also depends on the habitats found on private lands.

Hybrids. These comments identify a concern about whether captive wolves or wolf-dog hybrids jeopardize human safety if they are released or escape from their owners, erode public tolerance for wild wolves if someone has an encounter with an escapee, whether hybrids or captive wolves pose a risk to a recovered wolf population, and whether stricter laws need to be passed to further regulate or ban ownership. Wolf-dog hybrids have been responsible for human attacks, maulings, dismemberments, and deaths.

Wildlife Management Areas. These comments address wolf presence on FWP Wildlife Management Areas (WMAs). FWP manages a network of WMAs across the state to benefit wildlife, particularly wintering ungulates in western Montana. These purchases were made with revenues generated through sales of hunting and fishing licenses and matching federal funds. They are also used for outdoor recreational pursuits other than hunting, such as bird watching, wildlife viewing, fishing, or camping.

Issues not Evaluated in the EIS

FWP received a number of comments identifying issues or concerns that are beyond the sideboards of the federal wolf recovery program, beyond the statutory authority of the State of Montana, not relevant to the decisions being made, or otherwise outside the scope of the proposed action. These issues, and the rationale for their exclusion, are described below.

1. *Comments about the federal effort to reintroduce wolves into Yellowstone National Park and central Idaho.*

   Some comments questioned the wisdom, legality, or methods by which wolves were reintroduced to these areas. This was a federal effort directed and funded by the U.S. Congress to hasten the overall pace of wolf recovery in the northern Rockies under the Northern Rocky Mountain Wolf Recovery Plan. Federal actions were ultimately carried out and found to be legal and in compliance with the authority and scope of USFWS and ESA provisions. All legal challenges have been exhausted. Because wolves will remain in the Greater Yellowstone and central Idaho recovery areas, these comments were not analyzed further.

Table 1. The main issues identified through public scoping, spring 2002, and their frequency.

Main Issues	Number of Comments
Wolf Management, Numbers, and Distribution	1203, 611, and 193 respectively; 2,011 total
Social Factors	803
Administration and Delisting	623
Prey Populations	501
Funding	447
Livestock	414
Wolf Habitat, Connectivity, and Land Management	388
Questions	368
Compensation	287
Economics / Livelihoods	227
Information / Education and Public Outreach	208
Human Safety	162
Monitoring	151
Other Wildlife Species	80
Private Property	77
Hybrids	22
Wildlife Management Areas	13

2. *Comments calling for the removal of all wolves from the State of Montana, Yellowstone National Park, and central Idaho. Related comments suggested that wolves should not be permitted to enter Montana from Yellowstone National Park.*

   These issues were not considered further because they are outside the sideboards established by the Northern Rocky Mountain Wolf Recovery Plan, which calls for a viable, secure wolf population in the northern Rockies, encompassing the states of Montana, Idaho, and Wyoming. This EIS addresses future conservation management of a recovered population, not whether wolf recovery and/or wolf presence should be allowed in Montana or not. Wolves have been reported intermittently in Montana for a long time and have been continuously present in northwestern Montana since the early 1980s.

3. *Comments suggesting that the gray wolf should be classified as a "predator" under Montana law and managed as a bounty-animal.*

   This issue was not analyzed further because the "predator" classification under Montana law does not meet the standard of an adequate regulatory mechanism that ensures a viable, secure wolf population in the future. Wolves would not be delisted if assigned this legal classification under Montana statute. Furthermore, the 2001 Montana Legislature determined that upon removal from federal and state endangered species lists, wolves would be classified as a species "in need of management" in Montana statute. The FWP Commission could reclassify the gray wolf as a game animal or furbearer in the future when legal harvest, as a management tool, is determined to be biologically sustainable.

4. *Comments suggesting changes in state or federal highway design and construction, changes to federal land management practices, grazing management, travel management strategies, road densities, area closures, use of motorized vehicles, creation of more wilderness areas, etc.*

   These issues were not analyzed in significant detail because FWP does not have statutory authority over federal land management practices, decisions, or policies. However, FWP already does engage federal land managers during informal consultations to meet shared management objectives and assure habitat integrity for wildlife. Biologists with the Montana Department of Transportation are involved with minimizing impacts to the environment through the design, permitting, and wetland mitigation efforts for highways in Montana. Because habitat fragmentation, particularly for wide-ranging carnivores, is an important issue across a bigger geographic scale, the USFS appointed a national coordinator for wildlife/transportation issues who is located at the USFS Regional Office in Missoula. FWP personnel participate at the technical level, but FWP is not the lead agency for these efforts.

5. *Comments suggesting that delisting the gray wolf in the northern Rockies is premature because the population had not reached the biological recovery criteria. Related comments indicated that the wolf population would continue to warrant the protections of ESA even after reaching the biological recovery goals because of concerns about how western states would manage the population.*

   The decision to delist the gray wolf in the northern Rockies rests with USFWS, under the authority granted by the U.S. Congress. USFWS will also determine the adequacy of the regulatory mechanisms and the conservation plans of Montana, Idaho, and Wyoming to assure that the gray wolf would not need to be relisted in the future. These decisions are not within the statutory authority of the State of Montana. Nonetheless, this EIS will outline the philosophies, management strategies and tools by which Montana proposes to manage a delisted wolf population and maintain its contribution to the northern Rockies population. Upon completion of state planning efforts, USFWS will seek independent scientific peer review to determine the adequacy of the state plans to maintain the recovered population.

6. *Comments addressing the USFWS proposal to reclassify the gray wolf and adopt new regulations, as published in the Federal Register July 2000.*

   USFWS is the agency responsible for determining the classification of species protected by the federal ESA. The reclassification proposal published in the Federal Register in July 2000 pertains to the classification of the gray wolf while the species is still listed and recovery efforts are ongoing. The proposal is not directly relevant to the future conservation and management of a recovered, delisted wolf population in Montana.

7. *Comments addressing ESA, the need to modify it, or the scope of federal authority to recover species; other comments questioned why there was not a public "vote" about recovering wolves in Montana.*

   USFWS is responsible for planning and implementing recovery of rare and imperiled species, with cooperative participation by the state wildlife agencies. Actual species recovery proceeds according to provisions of ESA as they are implemented by USFWS and by species recovery plans, not by popular vote. USFWS is legally required to provide opportunities for public comment on its proposed actions and welcomes that public participation. Amending ESA is beyond the scope of this EIS.

8. *Comments suggesting that the real issue was "people management." Wolves should be allowed to increase in number and distribution and that human presence or uses of the landscape should be subordinated to wolf use.*

   This issue was not considered in further detail because FWP recognizes people as an important part of the wolf conservation equation. FWP seeks to integrate a wolf conservation and management program within an existing complex environment of people, other wildlife, landownership patterns, land uses, etc. -- thereby balancing the needs of wolves and people.

9. *Comments concerning commercial outfitting on federal public lands and the difficulty in changing "use days" or the areas where an outfitter is allowed to go, as wolves become established in new areas.*

   The regulation of commercial uses of federal public lands is carried out by the respective federal land management agency. FWP does not have any statutory authority in these matters. FWP provides opportunities and welcomes input from outfitters, federal land managers, and the general public on hunting season regulations and other programs related to big game management and ungulate population abundance.

10. *Comments expressing concern about the potential for legal challenges to either state or federal actions related to the delisting of the gray wolf in the northern Rockies or the implementation of Montana's program.*

    Interstate coordination is ongoing among Montana, Idaho, and Wyoming officials, with the common goal of a timely, efficient, and successful delisting of the gray wolf in the northern Rockies. In an advisory capacity, USFWS works closely with the states to ensure that each state meets the legal and scientific standards to ensure a smooth and timely transition. FWP is aware of the potential for legal challenges to either the federal proposal to delist, the preparation or adequacy of this EIS under Montana law, implementation of Montana's program or even specific elements of the program. The risk of potential litigation does not out weigh the benefits and responsibility of preparing to assume management authority upon delisting. This EIS is a necessary step to regain management authority, regardless of the potential for litigation in the future.

CHAPTER 2: AFFECTED ENVIRONMENT

This chapter describes the existing conditions with respect to the issues identified during scoping. It provides a foundation, or baseline, by which to compare the consequences that could occur from implementing any of the management philosophies, strategies, or tools contained within each of the alternatives described in Chapter 3. This chapter focuses on the resources that are most relevant to the issues raised by the public and the alternatives designed to address them.

A Review of the Gray Wolf in Montana

History

The gray wolf was extirpated from the western United States during the 1900s, primarily due to loss of habitat and conflicts with people. In 1884, the first statewide bounty law was passed in Montana. That first year, 5,450 wolf hides were presented for payment. All but three Montana counties reported a bounty payment for wolves from 1900-1931 (Riley 1998). By 1936, wolves were probably extinct in Montana, although they were occasionally observed and killed in the 1950s and 1960s (Curnow 1969, Singer 1979, Day 1981, Ream and Mattson 1982). No breeding pairs were known in Montana or elsewhere, and the occasional wolves taken were probably dispersers from Canada. Wolves were not legally protected in the U.S. until 1974. At that time, they were classified as "endangered" in all of the lower 48 states except Minnesota, where the gray wolf was classified as "threatened."

In 1980, the Northern Rocky Mountain Wolf Recovery Team completed a plan, which would guide wolf recovery efforts for a future wolf population in the northern Rockies. The plan designated three recovery areas -- Northwestern Montana, Central Idaho, and the Greater Yellowstone Area (GYA)--each of which included some portion of Montana (Figure 1).

Wolves started naturally recolonizing the Glacier National Park (GNP) area of northwestern Montana in 1979. In 1986, the first wolf den in over 50 years was documented within GNP. Since then, new packs have established throughout western Montana due to dispersers from Canada and the GNP area. To hasten recovery in the other two areas, USFWS reintroduced a total of 66 wolves from Alberta and British Columbia into central Idaho and YNP in 1995 and 1996.

Current Population Status and Distribution

Gray wolves are thriving and expanding in number and distribution in Montana, Idaho, and Wyoming (Figures 1 and 2). Within Montana alone at the end of 2002, there were approximately 183 wolves in about 34 packs distributed primarily in western Montana (Figures 3 and 4). While wolves are still found primarily in northwestern Montana and in the GYA, new packs are establishing along the Montana/Idaho border, in south central Montana, and outside the northeastern corner of YNP. There have been occasional reports in the Crazy, Highwood and Snowy mountains, but no breeding pack has been confirmed. The wolf population in the northern Rockies met the biological recovery levels at the end of 2002.

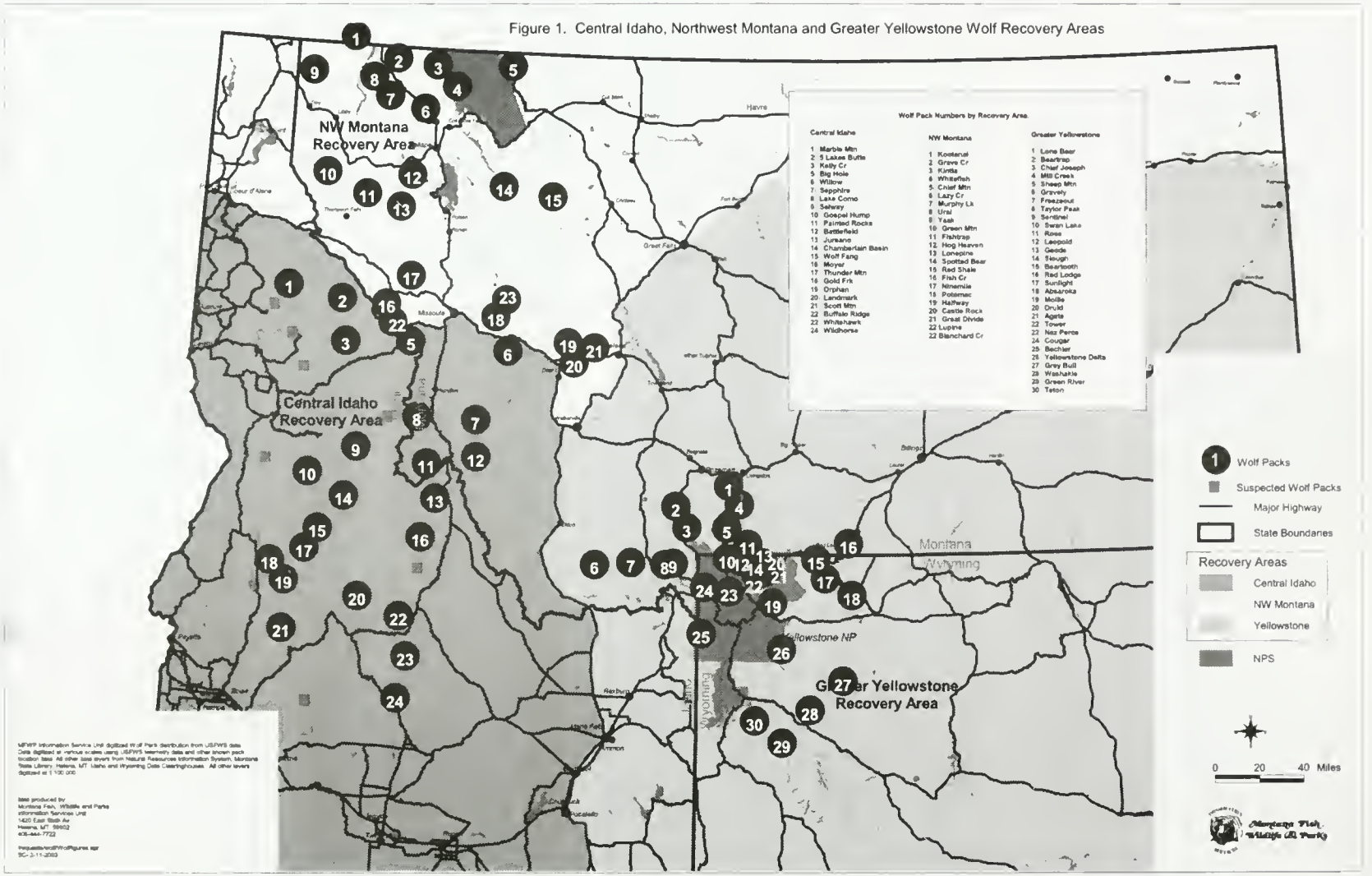

Figure 1. Wolf pack distribution in Montana, Idaho, and Wyoming, federal recovery area boundaries, and state boundaries (shown in bold). Large symbols represent established packs. Small symbols indicate newly formed packs or packs whose status is unknown at the present time. (Source: USFWS et al. 2002 and USFWS unpubl. data as of February 2003).

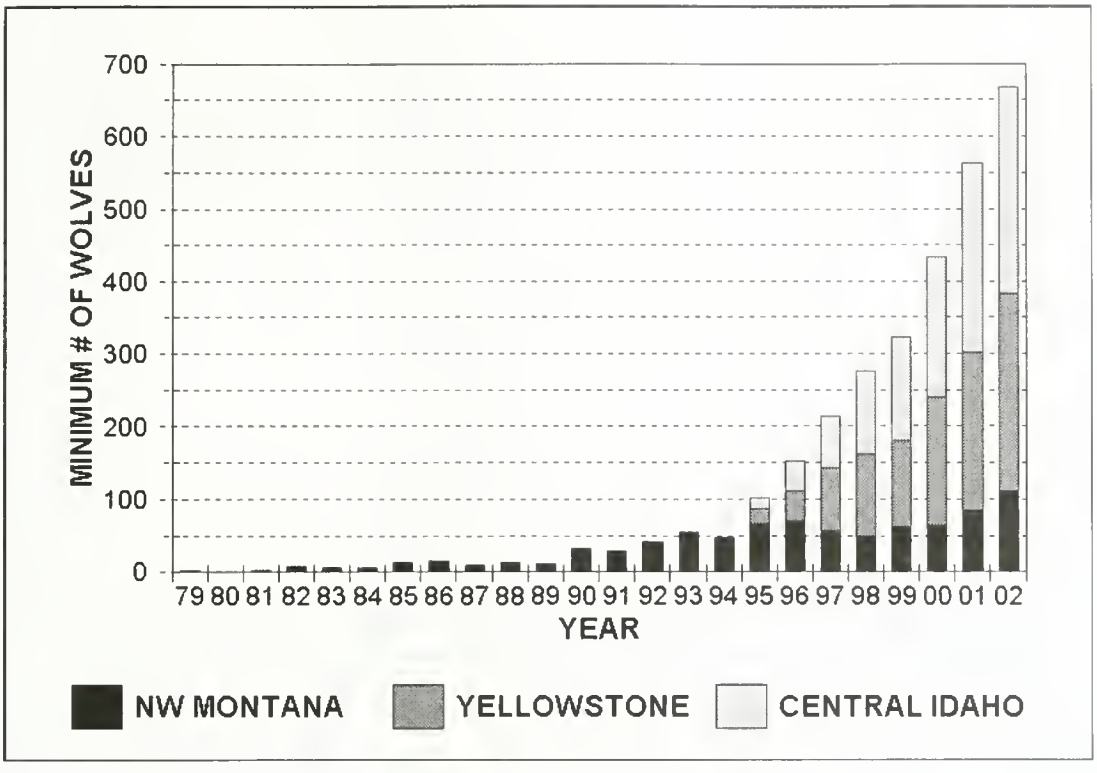

Figure 2. Grey wolf population trends in the Northwestern Montana, Greater Yellowstone, and Central Idaho recovery areas from 1979-2002. (Source: USFWS et al. 2002, and USFWS unpubl. data as of February 2003).

Ecology

Physical Characteristics. Male gray wolves in Montana weigh 90-110 pounds, and females weigh 80-90 pounds. About half of the wolves in Montana are black and the remainder gray. Both color phases may be found in a pack or in one litter of pups. Tracks are normally 4.5 to 5.5 inches long (Harris and Ream 1983).

Wolves may resemble coyotes, particularly when wolves are young. Wolves may also be confused with some large domestic dog breeds. Wolves are distinguished from dogs by their longer legs, larger feet, wider head and snout, narrow body, and straight tail. Other distinguishing characteristics require closer examination than is possible in field settings with live animals. In many instances, actual behavior must be used to distinguish wild wolves from wolf-dog hybrids and domestic dogs (Boyd et al. 2001, Duman 2001).

Pack Size. The highly social gray wolf lives in packs. Packs are formed when male and female wolves develop a pair bond, breed and produce pups. The pack typically consists of a socially dominant breeding pair (alphas), their offspring from the previous year, and new pups. Other breeding-aged adults may be present, but they may or may not be related to the others. Cooperatively, the pack hunts, feeds, travels, and rests together. The pack also shares pup-rearing responsibilities, including hunting and tending pups at the den or at a series of rendezvous sites. Pack size is highly variable, ranging from as few as three to as many as 37 (USFWS et al. 2001).

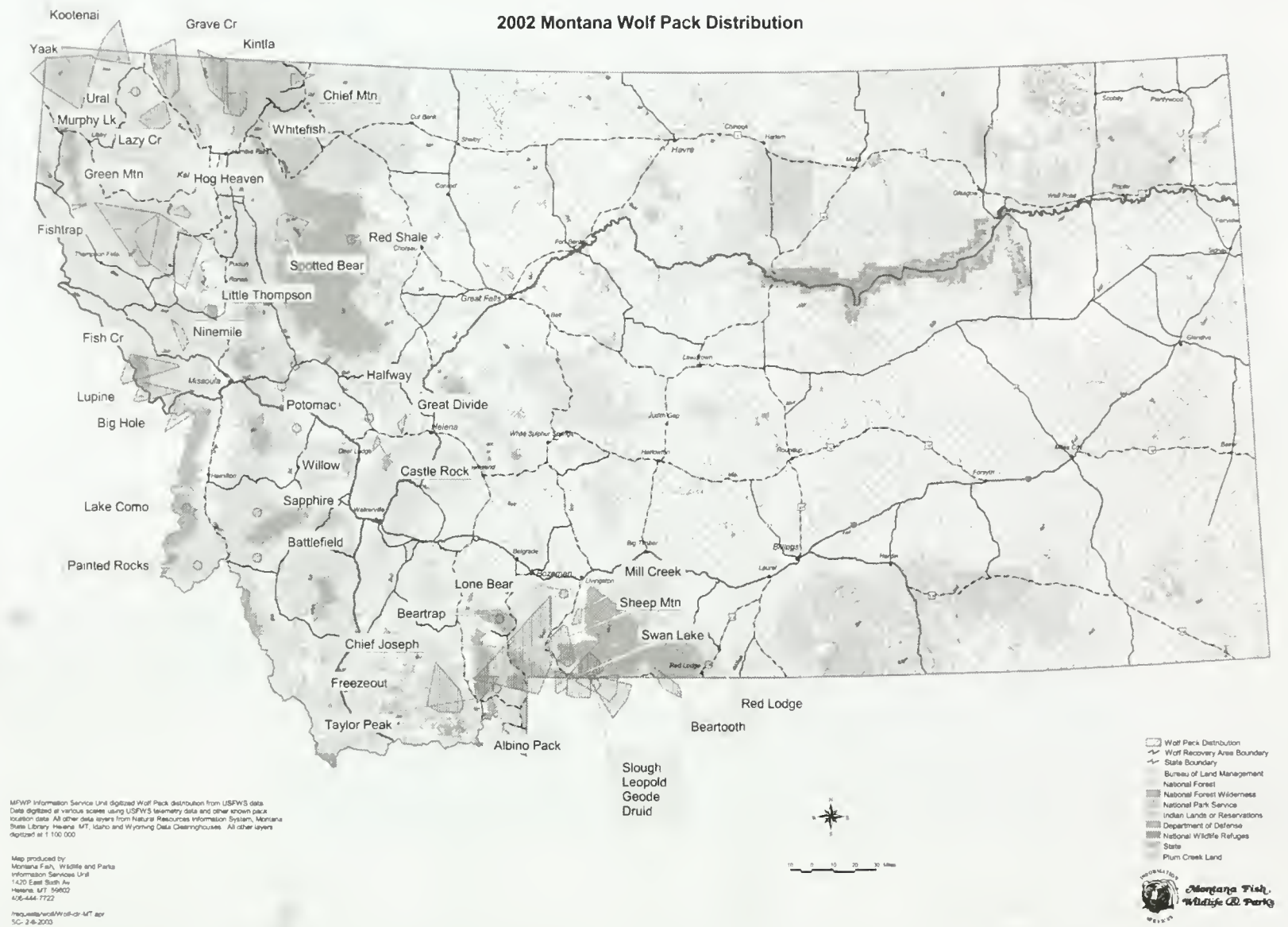

Figure 3. Wolf pack distribution and land ownership patterns in Montana. Approximate wolf pack territories are designated by the polygons with horizontal lines. Gray tones represent public lands and white indicates private lands. (Source: USFWS et al. 2002 and USFWS unpubl. data as of February 2003).

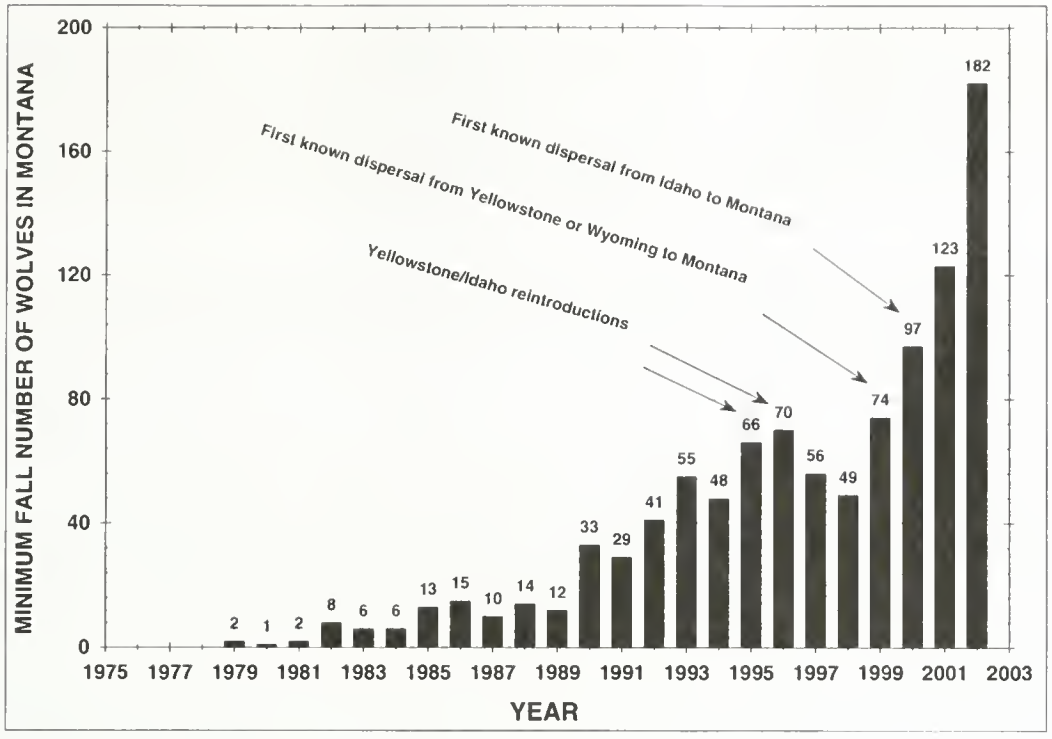

Figure 4. Minimum fall number of wolves in the State of Montana, 1979-2002, and the first known dispersal events leading to a new pack in the Montana population (USFWS unpubl. data). The arrows show the years of the first known dispersals of radio-collared animals into the State of Montana to start a new pack or join an existing pack.

Reproduction. Wolves normally do not breed until at least 22 months of age (Mech 1970). Breeding usually occurs only between the dominant male and female in a pack. In the northern Rockies, the breeding season peaks in mid- to late February (Boyd et al. 1993). Wolves localize their movements around a den site and whelp in late April, following a 63-day gestation period. After the pups are about eight weeks old, they are moved to a series of rendezvous sites. In northwestern Montana, maximum litter size averaged 5.3 (range 1-9) from 1982 to the mid 1990s. By December, average litter size declined to 4.5 (Pletscher et al.1997).

Pup survival is highly variable and influenced by several factors, including disease, predation, and nutrition (Mech and Goyal 1993, Johnson et al. 1994). In northwestern Montana from 1982-1995, 85% of pups survived until December, though survival varied year to year (Pletscher et al. 1997). Pup mortality in the first eight months of life was attributed to human causes (8 of 20 mortalities, 40%), unknown causes (2 of 20, 15%), and disappearance (9 of 20, 45%). In YNP, during the first four years, 133 pups were born in 29 litters and 71% were believed to still be alive in 1998 (Bangs et al. 1998). Pup survival varied between 73-81% from 1996-1998. However, canine parvovirus was strongly suspected as a contributing factor in the low pup survival (45%) in 1999. In 2000, pup survival rebounded to 77% (Smith et al. 2000).

Occasionally, more than one female in a pack may breed, resulting in more than one litter per pack (Ballard et al. 1987). This phenomenon has been documented in YNP (Smith et al. 2000, USFWS et al. 2000, USFWS et al. 2001).

Food Habits. The gray wolf is an opportunistic carnivore and is keenly adapted to hunt large prey species such as deer, elk, and moose. Wolves may prey on smaller species, scavenge carrion or even eat vegetation. In Montana, white-tailed deer, mule deer, elk and moose make up the majority of wolf diets. Ungulate species compose different proportions of wolf diets, depending on the relative abundance and distribution of available prey within the territory. In northwestern Montana, white-tailed deer comprised 83% of wolf kills, whereas elk and moose comprised 14% and 3%, respectively (Kunkel et al. 1999). However, 87% of wolf kills in YNP during 1999 were elk (Smith et al. 2000).

Wolves also scavenge opportunistically on vehicle- or train-killed ungulates, winterkill, and on kills made by other carnivores, particularly mountain lions. Wolves may also kill and feed upon domestic livestock such as cattle, sheep, llamas, horses, or goats. They may also kill domestic dogs but usually do not feed on the carcass.

Movements and Territories. A pack establishes an annual home range or territory and defends it from trespassing wolves. From late April until September, pack activity is centered at or near the den or rendezvous sites, as adults hunt and bring food back to the pups. One or more rendezvous sites are used after pups emerge from the den. These sites are in meadows or forest openings near the den, but sometimes are several miles away. Adults will carry small pups to a rendezvous site. Pups travel and hunt with the pack by September. The pack hunts throughout its territory until the following spring.

Pack territory boundaries and sizes may vary from year to year. Similarly, a wolf pack may travel in its territory differently from one year to the next because of changes in prey availability or distribution, conflict with neighboring packs, or the establishment of a new neighboring pack. Because the attributes of each pack's territory are so unique (elevations, land use, land ownership patterns, prey species present and relative abundance, etc.), it is difficult to generalize about wolf territories and movements.

After recolonizing the GNP area in the 1980s, individual wolves dispersed and established new packs and territories elsewhere in western Montana. Wolves demonstrated a greater tolerance of human presence and disturbance than previously thought characteristic of the species. It was previously believed that higher elevation public lands would comprise the primary occupied habitats (Fritts et al.1994). While some packs have established territories in backcountry areas, most preferred lower elevations and gentle terrain where prey is more abundant, particularly in winter (Boyd-Heger 1997). In some settings, geography dictates that wolf packs use or travel through private lands and co-exist in close proximity with people and livestock. Since the first pack established a territory outside the GNP area in the early 1990s, packs in northwestern Montana negotiated a wide spectrum of property ownerships and land uses. These colonizers also settled across an array of rural development.

With the exception of GNP packs, wolves in northwestern Montana move through a complex matrix of public, private, and corporate-owned lands. (The same is true of newly established packs in other areas of Montana.) Land uses range from dispersed outdoor recreation, timber production, or livestock grazing to home sites within the rural-wildland interface, hobby farming/livestock, or full-scale resort developments with golf courses. Landowner acceptance of wolf presence, and the use of private lands, is highly variable in space and time. Given the mobility of the species and the extent to which these lands are intermingled, it would not be unusual for a wolf to traverse each of these ownerships in a single day. Private land may offer habitat features or concentrations of wintering ungulates that are especially attractive to wolves so the pack may utilize those lands disproportionately more than other parts of their territory. Certain land uses may increase the risk of wolf conflict with humans or livestock.
The earliest colonizing wolves had large territories. Ream et al. (1991) reported an average of 460 square miles (mi^2). In recent years, average territory size decreased, probably as new territories filled in suitable, unoccupied habitat. In the Northwestern Montana Recovery Area during 1999, the average territory size

was 185 mi^2 (8 packs). Individual territories were highly variable in size, with a range of 24-614 mi^2 (USFWS et al. 2000).

Territories in the GYA were larger, averaging 344 mi^2 (11 packs). Individual pack territories ranged from 33 to 934 mi^2. Central Idaho wolf packs had the largest average territory size of 360 mi^2 (13 packs), with individual pack territories ranging from 141 – 703 mi^2 (USFWS et al. 2000).

Dispersal. When wolves reach sexual maturity, some remain with their natal pack while others leave, looking for a mate to start a new pack of their own. These individual wolves are called "dispersers." Dispersal may be to nearby unoccupied habitat near their natal pack's territory or it may entail traveling several hundred miles before locating vacant habitat, a mate, or joining another pack. It appears that dispersing wolves utilize scent-marking behavior and howling to locate other wolves, and frequently use similar travel paths used by previous dispersers. In this regard, habitats occupied by wolves sometime in the past will likely be occupied by wolves in the future, as long as the prey base remains adequate.

Boyd and Pletscher (1999) indicated that the dispersers in their study moved toward areas with higher wolf densities than found in their natal areas – in this case north toward Canada. This has important implications for Montana wolves because there are now resident wolf packs to the south and west in central Idaho and YNP. Dispersal has already resulted in the formation of several new packs in Montana between those core populations (Fig. 2) (Boyd et al. 1995, USFWS et al. 2001). Wolves will probably continue dispersing from the core areas and slowly occupy landscapes between the Canadian border, central Idaho and northwestern Wyoming (USFWS et al. 2000). Ultimately, this will yield a larger regional population, capable of genetic exchange across the international border and northern Rocky Mountains (Forbes and Boyd 1996, 1997).

Boyd and Pletscher (1999) studied wolf recovery in northwestern Montana from 1979 to 1997. Male wolves dispersed at an average age of 28.7 months and traveled an average of 70 mi from their natal territory before establishing a new territory or joining an existing pack. Females averaged 38.4 months old at dispersal and traveled an average of 48 mi. Males and females, combined, traveled an average of 60 mi (range 10 –158 mi). There were two peaks of dispersal: January-February (courtship and breeding season) and May-June.

Increasingly, dispersal is being documented among and between all three recovery areas in the northern Rockies (Bangs et al. 1998, Mack and Laudon 1998, Smith et al. 2000). Combined, there were 21 known dispersal events in 2000 and 19 in 1999 (USFWS et al. 2000). Dispersal paths crossed international boundaries, state boundaries, public and private land boundaries, different land uses, and agency jurisdictions.

Mortality. Wolves die from a variety of causes, usually classified as either natural or human-caused. Naturally caused mortalities result from territorial conflicts between packs, injuries while hunting prey, old age, disease, starvation, or accidents. In an established Alaskan wolf population largely protected from human-caused mortality, most wolves were killed by other wolves–usually from neighboring packs (Mech et al. 1998). However, in the northern Rockies, natural mortality probably does not regulate populations (USFWS 2000). Humans are the largest cause of wolf mortality and the only cause that can significantly affect populations at recovery levels (USFWS 2000). Human-caused mortality includes control actions to resolve conflicts, legal and illegal killings, as well as car/train collisions.

Genetics. In recent years, the application of genetic techniques to the study of wildlife populations has permitted managers to address issues of genetic diversity and population viability with increased confidence. These techniques have yielded information relevant to wolf conservation and management in the northern Rockies. Wolf recovery in the northern Rockies advanced from the combination of

recolonization of northwestern Montana by relatively few wolves from Canada and the reintroduction of wolves into YNP and central Idaho. In northwestern Montana, the founding population was small enough that inbreeding among closely related individuals was possible. Fortunately, the genetic variation among the first colonizers was high (Forbes and Boyd 1996). The combination of high genetic variation among colonizers and ongoing natural dispersal to and from Canadian populations was adequate to assure long-term population viability, provided that genetic exchange continued.

Similar inbreeding concerns existed for the relatively small founding population reintroduced to YNP and central Idaho. But wolves were trapped from two distinct source populations in Canada. The genetic variation among reintroduced wolves (and the source populations from which they came) was also high (Forbes and Boyd 1997). Overall, genetic diversity was similar among samples of natural recolonizers, reintroduced individuals, and the Canadian source populations. Field studies of wolf dispersal and migration distances supported the genetic results (Ream et al. 1991, Boyd et al. 1995, Boyd and Pletscher 1999). Wolf populations in the northern Rockies should not suffer from inbreeding depression.

An underlying tenant of the federal wolf recovery and restoration program is that each state's wolf population is functionally connected so that genetic material can be exchanged among the wolves in the three recovery areas and Canadian wolves. In isolation, none of the three populations could maintain its genetic viability (USFWS 1994a, Fritts and Carbyn 1995).

Population Growth. Wolf populations increase or decrease through the combination and interaction of wolf densities and prey densities (Keith 1983, Fuller 1989). Actual rates of change depend on whether the wolf population is pioneering vacant habitat (as in YNP and central Idaho), whether the population is well established (as in northwestern Montana), and food availability. The degree and type of legal protection, agency control actions, and regulated harvest also influence population trends. Once established, wolf populations apparently can withstand human-caused mortality rates up to about 30% of the fall population (Keith 1983, Fuller 1989).

If protected, low density wolf populations can increase rapidly if prey is abundant. Keith (1983) speculated that a 30% annual increase could be the maximum rate of increase for any wild wolf population. Once densities were high enough, social interactions probably intensify. Conflict and increased competition for food eventually cause a wolf population to level off or decline (Keith 1983, Fuller 1989).

Wolf populations in the GNP area (northwestern Montana and southeastern Alberta) increased an average of 23% annually from 1986-1993 (Fritts et al. 1995). After 1993, the population leveled off (Pletscher et al.1997). Those packs produced dispersers that eventually colonized vacant habitats in western Montana (USFWS unpubl. data). Some packs which formed in the Northwestern Montana Recovery Area since the early 1990s persisted, but others did not. Packs have been lost due to illegal killing by humans, agency control actions where livestock depredation was chronic, and for other unknown reasons.

The average annual rate of increase from 1992 to 2000 in northwestern Montana was 4.7% (USFWS et al. 2001). In 1992, the minimum mid-winter count (including pups) was 41 wolves. Sixty-two wolves were counted in 2000. The highest count was 70 wolves, at the end of 1996. The population grew in some years, but declined in others. Some of the variation probably reflects true changes in wolf numbers, but some variation may be due to decreased monitoring.

Prey populations influenced recent wolf population dynamics in northwestern Montana. White-tailed deer populations expanded from the late 1970s through the mid 1990s, in part precipitating and sustaining increases in wolf numbers and distribution. However, the winter of 1996/97 was exceptionally severe, and white-tailed deer populations declined significantly (Sime, unpubl. data). Other prey populations also

declined and poor recruitment was attributed to winterkill. USFWS believes that the significant decline in natural prey availability led to the record high number of livestock depredations and subsequent lethal control. Wolf depredations on livestock in 1997 alone accounted for 50% of all depredations in northwestern Montana between 1987 and 1999. Smaller prey populations likely translated to decreased wolf pup survival in 1997 and 1998, compared to 1996. Ungulate populations rebounded in recent years and the wolf population is also nearing its 1996 level.

Newly reintroduced wolves in the GYA and central Idaho exceeded all expectations for reproduction and survival (Bangs et al. 1998). Populations became established in both areas within two years, rather than the predicted three to five years. Pup production and survival in the GYA has been high. The average annual growth rate for the GYA from 1996-2000 is 35%, based on the minimum count as of December 31 and including pups (USFWS et al. 2001). However, population growth in the GYA slowed in 1999 after the rapid increase in the first three years post-reintroduction (Smith et al. 2000).

It is likely that population growth rates will slow for both the core Yellowstone and central Idaho populations because of declining availability of suitable, vacant habitat. However, these populations will be a source of founders for new packs outside the YNP and central Idaho recovery areas and within the state boundaries of Montana, Idaho, and Wyoming. Therefore, wolf numbers and distribution outside core areas are expected to increase rapidly in the next few years.

Pack membership typifies the predominant manner in which a wolf exists in the wild. The pack is the mechanism by which wolves reproduce and populations grow. However, in most wolf populations, some lone, nomadic individuals exist as dispersers -- looking for vacant habitat, waiting to be found by a member of the opposite sex within a new home range, or searching for an existing pack to join. Up to 10-15% of a wolf population may be comprised of lone animals.

This is a temporary transition. Wolves in northwestern Montana usually found other wolves in an average of 66 days (range 2-202 days) (Boyd and Pletscher 1999). Occasionally, lone wolves get into conflict with people and/or livestock, ultimately being lost to the population through legal or illegal means. For a wolf to make a contribution to the population, it must affiliate with other wolves. Until they affiliate with a pack, lone wolves are generally counted separately or omitted from total population counts altogether because they do not contribute to population growth and are difficult to detect by routine monitoring activities.

Interactions with Other Species. The relationships between carnivores and other species, and the ecosystems in which they live, could be the most poorly understood and controversial dimension of carnivore ecology (Estes 1996). The real question is not whether carnivores play important, unique roles in the natural functioning of ecosystems, but rather how they go about it, to what degree, and at what scale (Mech 1996).

Some researchers believe wolves could function as a "keystone species," which exists at relatively low abundance, whose effect on its community or ecosystem is relatively large and involves multiple levels on the food chain (Power et al. 1996, Estes 1996). Despite volumes of published literature on gray wolves, however, there is remarkably limited evidence of the precise nature, degree, and mechanisms by which wolves affect ecosystems.

Wolves kill ungulates, but the effects on ungulate populations are varied. Scavenging species, such as coyotes, common ravens, and wolverines feed on wolf kills. A wide variety of scavengers and other carnivores benefit from carrion being readily available year round, rather than just a pulse in the early spring because of winterkill (Stahler et al. 2001). Wolves may directly or indirectly compete for food with other carnivores (e.g. mountain lion) by selecting similar prey, or by usurping kills (Kunkel et al.

1999). Wolves have even been observed harassing grizzly bears in an attempt to take over ungulate carcasses (D. Boyd pers. comm.). Wolves sometimes kill other carnivores, such as mountain lions, coyotes, or grizzly bear cubs (White and Boyd 1989, Boyd and Neale 1992, Arjo 1998, Crabtree and Sheldon 1999). Biologists in the GYE have noted social interactions and occasional conflicts between gray wolves and grizzly bears over ungulate carcasses.

Social and Cultural Values

The social, cultural, and aesthetic values people assign to the gray wolf today grow out of a long and colorful history of interactions between wolves and humans. Public opinions about wolves vary greatly. Therefore, a range of alternatives was developed in this EIS to reflect that spectrum.

Early Native American Indians shared the landscape with the gray wolf. The wolf attained a cultural significance to many Indian tribes in Montana. In the days of European settlement and for decades thereafter, wolves were viewed unfavorably because they killed livestock during a period of dramatic declines in native prey populations and continue to do so sporadically today. Wolves were also perceived as a negative, controlling influence on prey populations. However, public opinion about predators and wolves, in particular, evolved through the 1960s and 1970s. For some in society, the gray wolf became a symbol for conservation of wildlife, the environment, and public lands.

Yet, there have been dramatic changes in the landscape since wolves roamed across Montana at the turn of the 20th century. Human settlement, the introduction of livestock and agriculture, and the current abundance and distribution of native ungulates make for a dramatically different landscape for wolves in the 21st century. In part because of these changes, some Montana citizens and organizations spoke out against wolf recovery and restoration efforts in the GYA and central Idaho, as well as against the legal protections afforded wolves by ESA in more general terms (USFWS 1994b). Concerns were expressed about the consequences of wolf depredations on livestock and the associated economic losses, potential loss of flexibility for federal land management agencies, land-use restrictions, impacts to big game populations, and reduced hunting opportunity. Indeed, FWP shared some of those concerns.

When discussing social and cultural implications associated with wolves, the primary affected environment is the values of people living in the presence of a recovered wolf population. A simplification about what drives the differences in attitudes towards wolves might be summed up in a few words: the perceived chance of personal benefit or loss resulting from the presence of wolves. Those who perceive they will benefit (either directly or vicariously) tend to favor wolf presence, and those who perceive a threat of personal loss oppose presence. These differences in values, attitudes, and opinions are clearly reflected in the comments FWP received from the public and account for the spectrum of input on any single issue.

Legal Status and Classification under Montana Statutes

Two Titles within Montana statutes describe the legal status and management framework for wolves. Title 87 pertains to fish and wildlife species and oversight by FWP. Title 81 pertains to MDOL and its responsibilities related to predator control. More recently, the 2001 Montana Legislature passed Senate Bill 163 (SB163), which amended several statutes in both titles. SB163 is included as an appendix in the Montana Wolf Conservation and Management Planning Document (Appendix 1).

The gray wolf remains listed as endangered under the Montana Nongame and Endangered Species Conservation Act of 1973 (87-5-101 MCA). Provisions in SB163, however, automatically remove the

gray wolf from the state endangered species list when it is removed from the federal list. Therefore, separate action to delist the gray wolf under state statute by the Montana Legislature is not required, but FWP would still need to update Administrative Rule 12.5.201, which lists state endangered species.

Once removed from the state endangered species list, the gray wolf will automatically be classified as a species "in need of management." FWP and the FWP Commission will then establish the regulatory framework to manage the species (MCA 87-5-101 to 87-5-123). "Management" is defined in MCA 87-5-102 as:

> "the collection and application of biological information for the purposes of increasing the number of individuals within species and populations of wildlife, up to the optimum carrying capacity of their habitat, and maintaining such levels. The term includes the entire range of activities that constitute a modern scientific resource program including but not limited to research, census, law enforcement, habitat improvement, and education. Also included within the term, when and where appropriate, is the periodic or total protection of species or populations as well as regulated taking."

In Montana statute, "take" means to "harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife." Thus, through the development of the EIS, FWP and the FWP Commission will establish the management parameters and regulations that limit taking, possession, transportation, exportation, processing, sale, offer for sale, or shipment of wolves. In addition, FWP and the FWP Commission would initiate the law enforcement, population monitoring, educational components, and other elements of a wolf program.

SB163 also amended Montana Statute 87-3-130, which is titled "Taking of Wildlife to Protect Persons or Livestock." This amendment becomes effective only when federal protections are removed. As amended, this statute relieves a person from criminal liability for the taking of a wolf if the wolf is "attacking, killing, or threatening to kill a person or livestock." In addition, "a person may kill or attempt to kill a wolf or mountain lion that is in the act of attacking or killing a domestic dog." The definition of livestock includes ostriches, rheas, and emus. These changes are consistent with the concept of protecting human life and private property (livestock and pets) when they are in imminent danger. Citizens must report any wolves killed or injured in defense of life/property to FWP within 72 hours and surrender the carcass, the pelt, and all wolf parts.

Most importantly, SB163 resolved an element in Montana statute that was a major impediment to establishing the federally-required regulatory mechanisms to guarantee the security and perpetuation of a recovered wolf population. SB163 deleted the gray wolf from the list of species designated as "predatory in nature" which are to be systematically controlled by MDOL (MCA 81-7-101 to 81-7-104). In other words, MDOL will not be required to exterminate wolves upon delisting. Instead, MDOL would control wolves for the protection and safeguarding of livestock, as long as the control action is consistent with a wolf management plan approved by both FWP and MDOL. MDOL and FWP would cooperatively address and resolve wolf-livestock conflicts.

FWP Administration

In the North American model of wildlife conservation, the states have almost sole authority for conservation and management of resident wildlife. The exceptions are for federal trust species (e.g. migratory birds or threatened/endangered species), reserved federal lands (e.g. national parks), and for Indian reservations, as per treaty rights where the tribes maintain wildlife management authority within

reservation boundaries. In Montana, FWP is the agency with the statutory responsibility to manage resident wildlife. FWP's Wildlife Program is coordinated at the statewide level and implemented through seven administrative regions.

The Montana Legislature authorizes staffing with the numbers of Full Time Equivalent employees (FTEs) being adopted with the state budget. Within those programs affected by the outcome of the EIS, current staff includes 97 FTEs in the Wildlife Division, 22 FTEs in the Conservation Education Division, 99 FTEs in the Enforcement Division, 39 FTEs in Field Services, and 97 FTEs in Management and Administration. Outside the Wildlife Division, staff time devoted to support and administration of the wildlife program varies annually, with an estimated 35-40% spent on wildlife related activities. Some of these duties include: enforcement of game laws, licensing and inspection of game farms, responding to game damage complaints and human/wildlife conflicts, meeting public education needs, hunter and bow hunter education, publishing the FWP magazine *Montana Outdoors*, producing educational videos, printing and distributing maps and regulations, conducting drawings for limited permits, issuing special and nonresident licenses, negotiating land acquisitions, developing terms for conservation easements, and tracking expenditures (FWP 1999).

FWP Funding

State law authorizes FWP to collect fees from hunters, trappers, and anglers (87-1-601, MCA). Most of these revenues are channeled back into management of the resources generating it. The Montana Legislature has earmarked about 20% of all license revenues for specific purposes, such as habitat protection or hunter access. The remainder of these funds is deposited into one general license account without regard to the species generating the revenue. Although license revenue could be considered as state revenue, its use is limited to funding FWP programs by law. In order to maintain FWP's eligibility to receive matching federal funding under the Federal Aid in Wildlife Restoration Act (Pittman-Robertson), the Montana Legislature agreed to use hunting license revenue only for wildlife management (87-1-708, MCA). Similarly, use of interest earned from cash balances on license revenue can only be used to fund FWP programs. About two-thirds of the total license revenue collected by FWP is derived from the sale of nonresident hunting and fishing licenses.

The Federal Aid in Wildlife Restoration Act has helped fund FWP's wildlife management programs since 1941 (Kallman 1987). In 2002, approximately 26% ($15.1 million) of FWP's total revenue was obtained from federal sources. Most of this funding is generated through excise taxes on firearms, ammunition, archery equipment, and handguns. Federal funding matches state license revenue to fund wildlife surveys, research, hunter education, and various support functions. Wildlife surveys and inventories and other approved projects typically receive 75% federal funding and 25% state funding from license revenues. Federal funding also was initially used to purchase winter range for big game. Federal law requirements also protect the state's hunting-license revenue from being diverted to uses other than those pertaining to wildlife under the assent acts passed by the Montana Legislature (87-1-708, MCA). Federal law restricts some uses of matching federal funds to exclude some activities such as law enforcement that in turn, must be funded entirely by state hunting, fishing, or trapping license revenue.

Funding sources for the wildlife program include license dollars, matching federal funding, Bonneville Power Administration mitigation trust funds, and private grants and donations. License sale revenues account for approximately 65% of the wildlife program budget. The Wildlife Division received 19% ($11.1 million) of FWP's FY 2002 total budget of $58.8 million. Conservation Education was budgeted $2.5 million, Fisheries $9.6 million, Enforcement $6.4 million, Field Services $7.3 million, and Management and Finance $11.4 (FWP 2002). Budgets are developed internally, with authority to spend funds coming from the Legislature. All budgets are reviewed by the legislative budget committee and

must be approved by both the Montana House and Senate. The FWP Commission also reviews and approves the agency's budget.

Wildlife Resources

Montana's wildlife includes more than 450 species of mammals, birds, reptiles, and amphibians. FWP has statutory responsibility to regulate harvest of 55 wildlife species that are valued for meat, fur, or as "trophies." Many of these species were almost lost in Montana as a result of unregulated exploitation prior to and during settlement in the late 19th and early 20th centuries.

Enforceable wildlife conservation began with the political and financial support from Montana's hunters and anglers early in the 20th century. Early programs emphasized restoring game animals, providing legal protections in state statute, and aggressive predator control. These actions were initiated with public and legislative support and were largely funded by the hunters, anglers, and trappers of Montana. These programs were then, and are now, sustained by a philosophy of public hunting and a funding base from participants. FWP's wildlife program has evolved along with modern scientific principles of wildlife management and is considered one of the leading programs in the nation.

Categories of Wildlife Defined in Montana Statutes

Big Game. Thirteen species of large mammals are defined by statute as game animals, or "big game" (87-2-101 MCA). These include white-tailed and mule deer, elk, moose, and caribou, pronghorn, mountain goat, bighorn sheep, and wild bison. Three species of carnivores/omnivores also are designated as game animals, including the mountain lion, black bear, and grizzly bear. Today, all the above big game species except caribou, bison, and grizzly bear are legally hunted, according to regulations approved by the FWP Commission.

Numbers and distribution of most big game species probably bear little resemblance to pre-settlement conditions. Nearly all big game species were either extirpated or severely reduced in number and distribution through market and subsistence hunting prior to and during settlement. Settlement brought agriculture, forestry, mining, and suppression of catastrophic fires and flooding, causing both subtle and profound changes to Montana's landscape. These changes favored some species and were detrimental to others. Present day populations of white-tailed deer and elk are at their highest levels recorded in recent history. Mule deer numbers fluctuated over the last 20 years, but the statewide population is still robust.

In addition to natural adjustment and recovery by some big game species, efforts to restore self-sustaining populations to all, or portions of, historical ranges have been largely successful. Such efforts included species reintroduction and the acquisition and intensive management of important habitats. In the case of the mountain lion, a change in legal status from a "predator" to a "big game animal" in the early 1970s enabled lion numbers and distribution to increase over the last 30 years. Mountain lions are now present in eastern Montana in sufficient numbers to sustain a legal harvest.

Furbearers. FWP is responsible for management of furbearers (87-2-101, MCA). State law offers protection to ten furbearing species because of the commercial value of their fur. Protection allows for maintenance of sustainable populations while allowing for harvest of prime pelts. Furbearer management has evolved since 1951 when the agency initiated intensive studies on furbearer species throughout the state.

The ten species are: marten, otter, fisher, mink, wolverine, bobcat, lynx, northern swift fox, muskrat, and beaver. Except the northern swift fox and lynx, all these species may be taken by licensed trappers according to regulations approved by the FWP Commission.

Predators. The predator designation is confusing because the term refers to both a legally defined list of animals as well as an ecologically functional group of animals. State law lists the coyote, red fox, weasel, skunk, and civet cat (spotted skunk) as predators (87-2-101, MCA). Ecologically speaking, predators generally kill other animals to secure food. Under this ecological definition, several mammals function as predators but are legally designated as furbearers: bobcat, lynx, wolverine, swift fox, otter, mink, marten and fisher. Others are legally defined as game animals (black bear, mountain lion), nongame wildlife (red fox, raccoon, badger), or threatened and endangered species (grizzly bear, black-footed ferret).

Control of legally classified predators (e.g. coyote, skunk) is assigned to MDOL and carried out by WS. However, WS also controls some game animals (bears and mountain lions) causing livestock damage under a Memorandum of Understanding (MOU) with MDOL and FWP.

Nongame Wildlife, Endangered Species, and Species of Special Concern. FWP's wildlife program has emphasized management of game and furbearer species over nongame. The Nongame and Endangered Species Conservation Act (87-5-101, MCA) expanded FWP's authority in 1973 to include nongame and endangered species. More than 85% of the bird and mammal species in Montana are classified as nongame. FWP has the authority to declare certain nongame species as being "in need of management" and to develop and adopt management plans.

The Montana Natural Heritage Program oversees an ongoing inventory of animals that are rare, threatened, endangered, or believed to be vulnerable to extirpation (Reichel 1996). FWP also maintains a current listing of wildlife species of special concern. The list includes amphibians, reptiles, birds, and mammals and appears in Appendix 2. Of these, seven species are classified as threatened or endangered by federal statute. Montana law does not include a "threatened" status, but four species are listed as endangered under state statute (Appendix 2).

Other. Other statutorily defined wildlife species are classified as Upland Game Birds (grouse, turkey, pheasant, partridge, Section 87-2-101 MCA) and Migratory Game Birds (ducks, geese, swans, doves, snipe; 87-2-101, MCA).

Wolf - Prey Relationships

Montana's recovered wolves are returning to a highly modified environment and a managed system where success, like the success of other major predators like mountain lions and even human hunters, depends on the productivity and perpetuation of deer, elk, and moose populations. As a result, a primary public concern is the effect of predators on prey populations. This EIS cannot provide a comprehensive summary of predator-prey interactions or the effects of wolf predation on ungulate populations. However, some of the scientific literature reviewed for this EIS is included as a partial bibliography in the Montana Wolf Conservation and Management Planning Document (Appendix 1).

All wildlife populations vary through time and across a diversity of habitats and are influenced by a variety of ever changing environmental factors. Published literature on predator-prey interactions is highly varied in its conclusions about the ability of predators to influence prey populations or *vice versa*. There have been nearly as many different interpretations of predator-prey interactions as there have been studies. Predators and prey interact with one another within their unique habitats, through seasonal weather patterns, among an array of species and animal densities, and within different wildlife management frameworks. Each published report, therefore, must be interpreted within the context of the

conditions prevailing at that time and cannot be extrapolated to different locations or ecological systems (National Research Council 1997).

Studies show that predation may influence prey populations through changes in recruitment of young into the adult population, adult mortality, or a combination of both (Gasaway et al. 1992, Ballard et al. 1997, National Research Council 1997, Mackie et al. 1998, Kunkel and Pletscher 1999, Ballard et al. 2001). Research also suggests that increased adult female mortality from other sources, such as hunter harvest or elevated overwinter mortality, may create conditions in which predation limits ungulate populations or slows population growth (Kunkel and Pletscher 1999). On the other hand, some biologists reported that habitat and climate influence deer populations more strongly than wolf predation (Wisconsin Department of Natural Resources 1999). And some Minnesota researchers report that wolves do not appear to impact white-tailed deer populations overall, although wolf predation may have more influence in localized areas and especially in conjunction with severe winters (Mech and Nelson 2000, Minnesota Department of Natural Resources 2001). The impact of severe winter weather is a concern in the West as well. Recent findings in YNP indicate that winter severity has a dominating influence on wolf predation patterns on elk (Mech et al. 2001).

Identifying the factors that drive changes in prey populations and predator-prey interactions is extremely difficult. More than one factor is usually involved, and factors may interact with one another to further complicate efforts to understand their importance. FWP's ungulate management attempts to balance population status, habitat condition, landowner tolerance, hunter opportunity, and an array of environmental factors known to influence populations. Ungulate populations are managed in a comprehensive, ecological way, considering the whole environment, not single factors such as wolf predation or lion predation. Documenting predation as a major limiting factor of ungulate populations requires intensive radio telemetry, manipulation of both predator and prey populations, measurement of environmental conditions, a well designed monitoring program, and a sustained long-term effort. Systems with multiple large predators, including wolves, are even more challenging. FWP's current understanding of how ungulates, wolves, other carnivores, and their physical environments interact in Montana will improve with time through monitoring and research, such as the ongoing intensive studies in southwestern Montana and YNP. Management improves as a result.

Because of their long-term financial investments and willingness to impose hunting regulations to best conserve wildlife, Montanans now enjoy relatively liberal hunting opportunity for more ungulate species than other western states. This is evident in long-term trends in hunter numbers and harvest for both elk and deer (Figures 5-8). Statewide, the number of elk hunters and elk harvest has gradually increased since the 1960s. This reflects the increasing interest in elk hunting as elk populations increased and expanded into formerly elk-free habitats. Long-term trends for deer are more volatile and reflect real changes in deer abundance and corresponding changes in hunter opportunity due to changes in hunting regulations. At the FWP regional scale and the individual hunting district level, the long term trends are more variable.

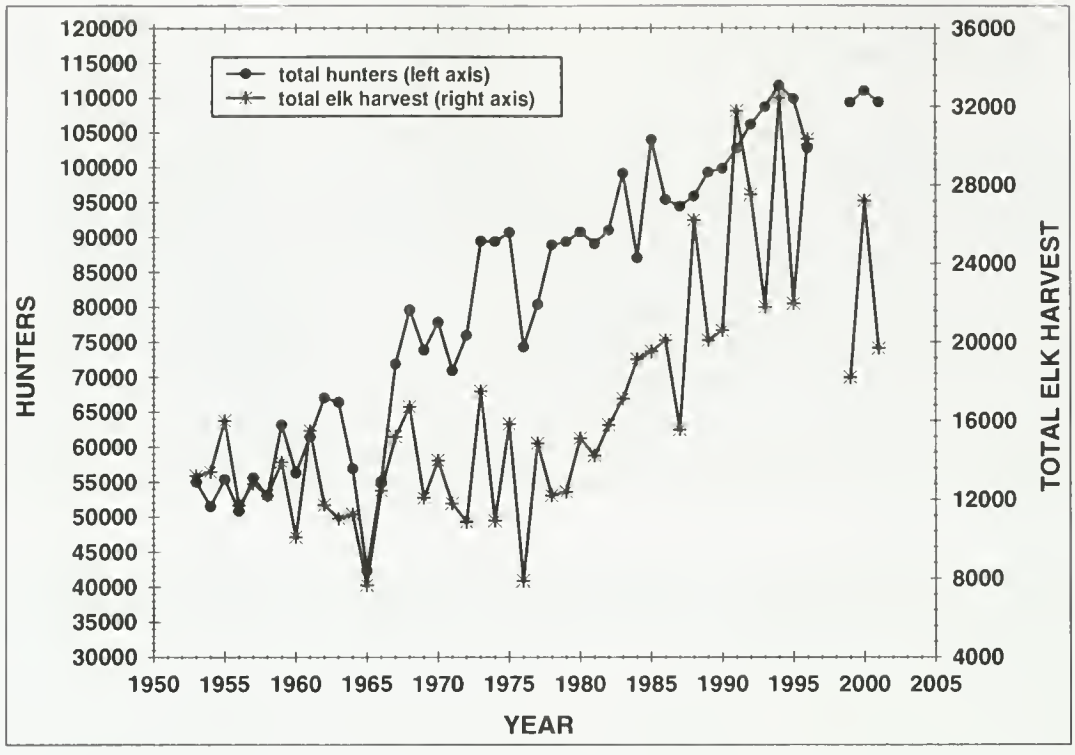

Figure 5. Total number of elk hunters and total elk harvest in Montana, 1954-2001.

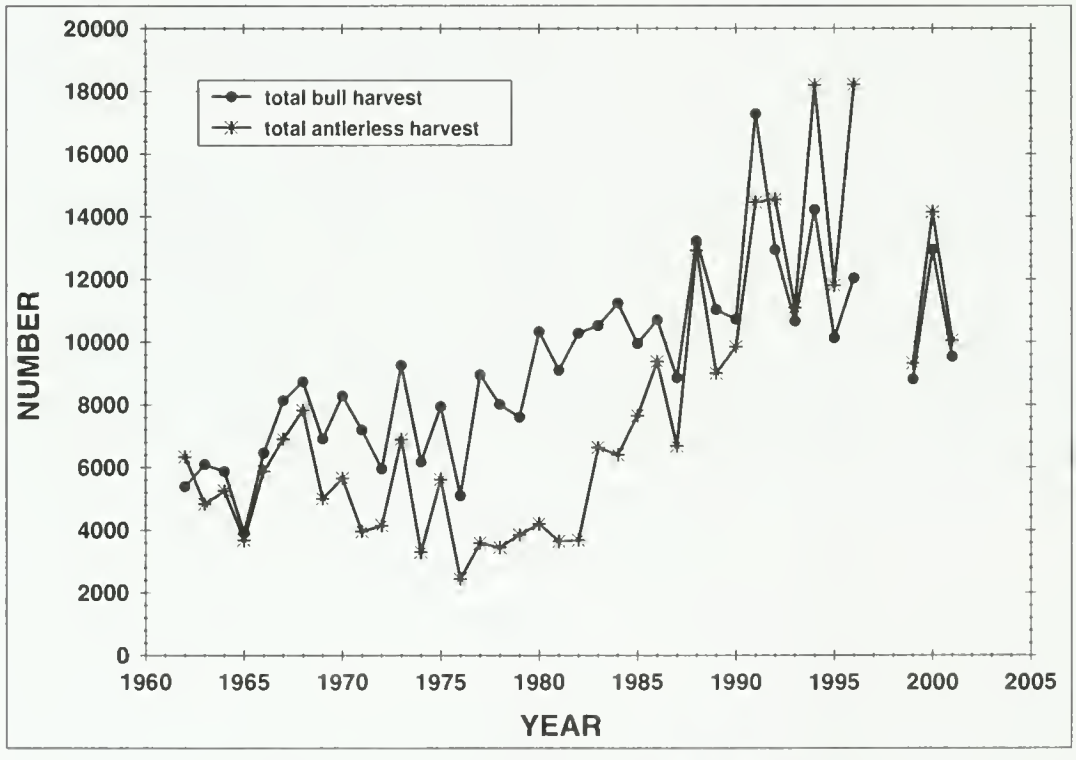

Figure 6. Total bull elk and antlerless elk harvest in Montana, 1960-2001.

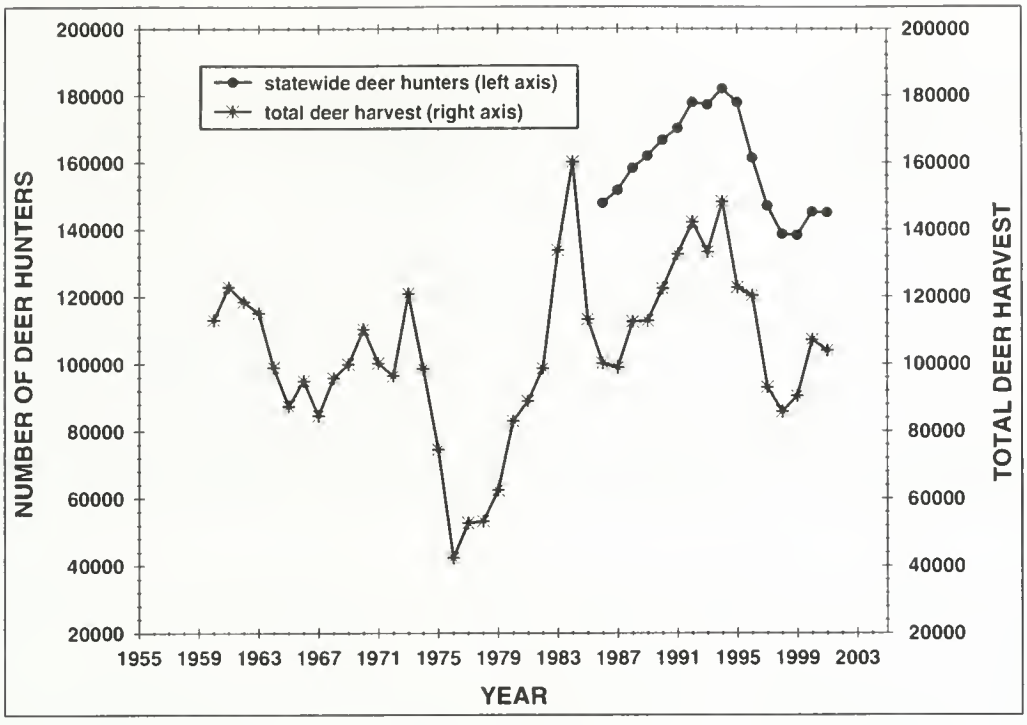

Figure 7. Total deer harvest for white-tailed deer and mule deer combined 1960-2001 and total number of deer hunters in Montana, 1985-2001.

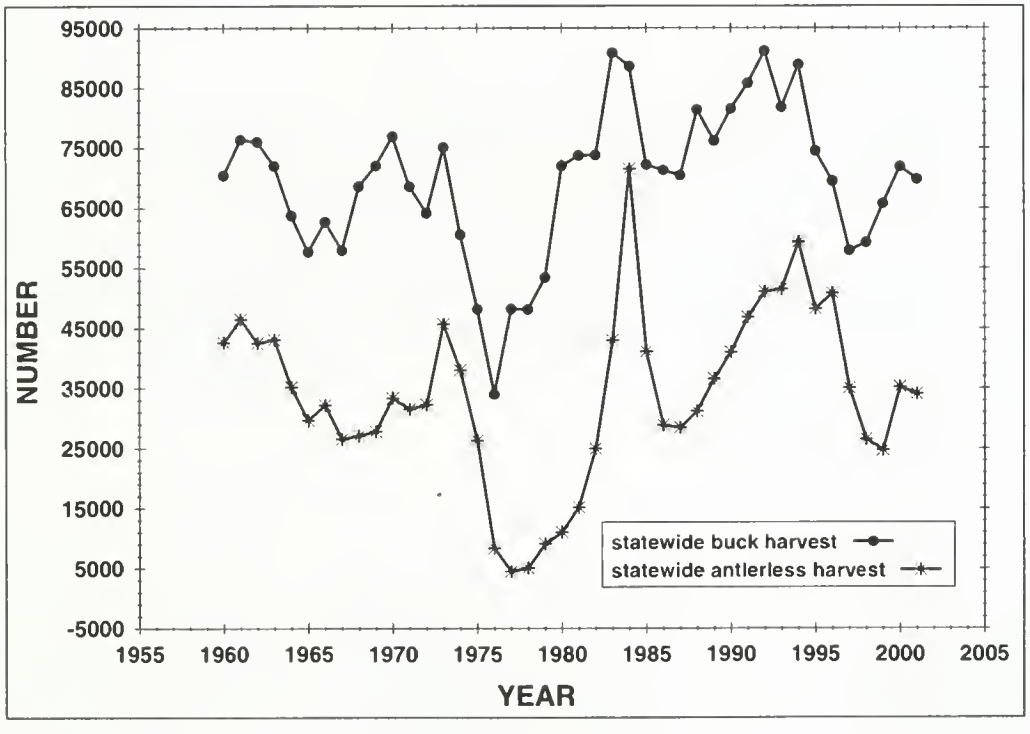

Figure 8. Total buck and total antlerless harvest for white-tailed deer and mule deer combined in Montana, 1960-2001.

Wildlife Habitat

Montana's diverse landscape can be described as six ecosystems based on topography, climate and vegetation (Table 2). The gray wolf is a habitat generalist and historically occurred across all vegetation types in Montana where there was adequate prey. Hence, current day wolf habitat will be defined more specifically by ungulate distribution and human settlement patterns.

A keystone of FWP's habitat conservation efforts is Habitat Montana. This program focuses on land conservation initiatives that benefit wildlife and maintain other natural resource values of private lands. FWP administers a network of Wildlife Management Areas (WMAs) that are managed to benefit wildlife (wintering ungulates in particular) and to provide opportunities for public recreation. These lands are purchased using earmarked revenue collected from the sale of hunting licenses and matching federal revenues. Vegetation management objectives on many of them are met in part by livestock grazing through cooperative agreements with adjacent landowners. FWP also participates in numerous federal habitat conservation programs, such as a Forest Legacy (USFS) and Habitat Conservation Plans (USFWS).

Table 2. Six major ecosystems of Montana based on topography, climate and vegetation.

Ecosystem	Topography	Predominant Vegetation	Climate
Montane Forest	Mountainous	Forest, usually conifer dominated	Maritime in northwestern Montana; continental in southwest Montana
Intermountain Grassland	Intermountain valleys and foothills	Grasslands or agriculture	Continental
Riparian	Gentle to mountainous; adjacent to surface water (lakes, rivers, wetlands etc.)	Various; when forested, dominant tree/shrub cover is deciduous	
Shrub Grassland	Level, gently rolling; locally steep in the mountains; dissected river breaks	Shrubs dominate; deciduous trees or shrubs in wetter areas	
Plains Grassland	Generally flat to rolling; badlands; glaciated in the north	Shortgrass prairie, prairie badlands; agriculture	Semiarid; cold winters, warm summers; highly variable
Plains Forest	Uplands in plains areas; dissected; moderately steep	Forest, usually conifer	

Plant Species of Special Concern

Montana supports a rich diversity of plant species. The Montana Natural Heritage Program has identified 365 species of vascular plants that are of special concern in the state (Heidel 1996). The term "special concern" is applied to plant species that could be reduced in number by land management to the point where they would be listed as threatened or endangered. USFWS is responsible for listing threatened and endangered plant species that require protection under the federal ESA.

Noxious Weeds

Introduced plant species often aggressively colonize sites where native vegetation and soils are disturbed. When these plants conflict with, interfere with, or otherwise restrict land management, they are commonly referred to as weeds. A plant that has been classified as a weed, such as leafy spurge or spotted knapweed, only attains a "noxious" status by an act of state legislation. Noxious weeds are classified in one of three categories (Appendix 3).

Land Management

Travel/Access Management

Responsibility for managing human access and travel on public lands resides with the administering land management agency, whether state or federal. Human access can be managed by time period (e.g. seasonal closures) or by localized area restrictions. FWP closes most WMAs to human access during the winter period to prevent disturbance to wintering ungulates. Outside of Yellowstone and Glacier national parks, USFS manages most federal lands utilized by wolves. Habitat, access and motorized travel are managed to meet resource objectives or legal requirements. Presently, there are no restrictions on road use or road-density on USFS or U.S. Bureau of Land Management lands due solely to the presence of wolves. NPS generally restricts motorized travel to paved routes only, while foot/horse travel is permitted most places. Foot travel is occasionally restricted due to seasonally imposed closures in areas of concentrated wildlife activity. While FWP continues to consult with land management agencies or private landowners about access and travel management, FWP has no legal authority to implement access or travel restrictions on land it does not manage. Instead, FWP works cooperatively with land managers to meet shared objectives.

Connectivity

Connectivity implies that wolves inhabiting the Northern Rocky Mountain Recovery Area in each of the three states are functionally connected through emigration and immigration events, resulting in the exchange of genetic material between sub-populations. This functional relationship is consistent with the biological intent of the original northern Rockies recovery plan and is an underlying prerequisite for successful, long term wolf recovery in the northern Rockies. Designating critical habitats or establishing travel corridors were not necessary to successfully recover the gray wolf in the northern Rockies. During the recovery phase, connectivity of the wolf population in the northern Rockies with the Canadian population was assured through legal protections, adequate prey populations, and the network of public lands – all of which facilitate dispersal and maintenance of genetic viability.

Sufficient dispersal and exchange of wolves between the three sub-populations in the future will be necessary to maintain the high degree of genetic variation of a regional wolf population. In isolation, none of the three recovered populations could maintain its long term genetic viability (USFWS 1994a). Isolation is unlikely if populations remain at or above recovery levels and regulatory mechanisms prevent chronically low wolf numbers or minimal dispersal (Forbes and Boyd 1997).

Connection between the U.S. and Canadian wolf populations is also an important underpinning of long term wolf recovery. Montana is an important link between Canadian wolves and wolves in YNP, Wyoming, and central Idaho. Canadian packs will likely continue to be a source of wolves dispersing into the U.S. while some U.S. wolves will disperse into Canada. Dispersal events across the international border will contribute to genetic diversity and provide an added measure of long term security for populations in both the U.S. and Canada.

Wolf Den and Rendezvous Sites

Wolves respond differently to human disturbance (Claar et al. 1999). Differing responses are due to a variety of factors, including the individuality of wolves, the specific setting, and whether the population is exploited or protected (Ballard et al. 1987, Mech et al. 1998, Thiel et al. 1998). In some studies, wolves moved pups after human disturbance, but pup survival was not affected (Ballard et al. 1987). It also appears that pups were not moved over long distances (Thiel et al. 1998).

Wolf activity on national forest lands in Montana generally hasn't prompted area closures or travel restrictions specifically because recreational use of these lands is often dispersed and sporadic. In national parks, area closures around den or rendezvous sites are sometimes implemented because of the strong public desire to view wolves and high visitation in the areas with wolf activity during the denning period. Areas around dens in YNP are closed until June 30. GNP established a seasonal closure area in the North Fork for one wolf pack since 1995 and has a framework for addressing future wolf activity. Ultimately, land management agencies may adopt seasonal or area restrictions independently from FWP.

Economics / Livelihoods

A number of economic resources or values could be affected if FWP assumes management responsibilities for the gray wolf. The following description is based on the most current information available on livestock depredation by wolves, big game hunting and outfitting, regional economic activity, cultural and social values, recreation, and FWP license revenues. The most detailed information available is specific to the GYA and southwestern Montana due to the in-depth analyses required prior to the reintroduction of wolves to YNP and central Idaho. Information is also available from northwestern Montana where wolves have been present since the mid-1980s, and statewide information is also presented.

Livestock Depredation

A concern about wolf recovery is the potential for wolves to stress, injure, or kill livestock (primarily cattle and sheep), guarding animals, or other domesticated animals such as llamas. Financial losses may result directly from wolf depredation whether confirmed or not, and indirect financial losses may accumulate because of increased management activities or changes to agricultural operations. These financial hardships accrue to individual farmers and ranchers and may be significant to them.

Tables 3 and 4 show total annual Montana cattle and sheep inventories and death losses from all causes since 1990. Cattle and calf inventories in the state have remained relatively stable at about 2.5 million animals. During this period, sheep inventories have declined significantly from over 650,000 to nearly 400,000 animals. While there has been significant variation in death losses for both cattle and sheep over this period, both species have seen losses in excess of 50,000 animals per year for predator and non-predator losses combined.

Currently, the Montana staff of WS investigates and records all reported wolf kills of domestic livestock or pets. Table 5 summarizes the Montana WS wolf depredation control program from 1997-2002, reported according to federal fiscal years. To date, nearly all depredation incidents investigated by WS within Montana occurred on private land, whereas over 80% of depredations in Idaho and about 50% of depredations in Wyoming were on public grazing allotments (Meier 2001). As wolf numbers and distribution increase in Montana, depredations may also increase on public lands. Between 300,000 and 400,000 sheep and cattle graze summer pasture on public lands in Montana (Bangs and Shivik 2001). Wolves don't necessarily depredate on livestock whenever livestock are encountered, but it is evident that

wolf packs that regularly encounter livestock will depredate sporadically (Bangs and Shivik 2001). Field observations have also indicated that even though an individual wolf or pack may not necessarily injure or kill livestock, livestock can become distressed and agitated when wolves are in the area and sometimes injure themselves in fence lines or on agricultural equipment. Overall, livestock losses appear related to the availability of wild prey, increasing pack size, and the learned behavior of individual wolves.

Table 3. Cattle and calf inventory, value per head, and death losses in Montana from all causes 1990-1999 (Montana Agricultural Statistics: October 1999, p. 146, information on January 1.).

Year	Total Cattle and Calf Inventory (animals)	Value per Head ($)	Total Animal Death Losses
1990	2,250,000	675	84,000
1991	2,650,000	755	65,000
1992	2,550,000	720	68,000
1993	2,500,000	760	65,000
1994	2,550,000	780	77,000
1995	2,700,000	675	70,000
1996	2,750,000	560	80,000
1997	2,700,000	600	100,000
1998	2,600,000	740	127,000
1999	2,600,000	660	82,000

Table 4. Annual predator losses (all species combined) and non-predator losses of sheep and lambs (number of head) in Montana, 1990-1998, (Montana Agricultural Statistics: October 1999, pp. 150-51).

Year	Jan 1 Sheep and Lamb Inventory	Predator Losses	Non-predator Losses
1990	663,000	39,100	79,900
1991	683,000	44,900	83,500
1992	678,000	41,200	63,000
1993	564,000	40,200	59,400
1994	534,000	42,900	53,800
1995	490,000	37,100	46,900
1996	465,000	31,200	39,200
1997	432,000	27,000	49,100
1998	415,000	21,800	38,700

Figures 9 and 10 display the number of confirmed cattle and sheep depredations by wolves in Montana since wolves first started recolonizing Montana in the mid-1980s. The number of wolf depredation incidents generally increased as wolves increased in number and distribution, with some variation from one year to the next. During 1999-2001, an average of 15 cattle and 27 sheep per year were confirmed as

wolf kills. This level of loss is <0.5% of the total death losses for cattle and sheep, respectively, in the state. However, as indicated above, these losses accrue to individual producers and only represent dead livestock that were confirmed killed by wolves. There were no confirmed cases of wolves killing dogs or llamas until 1995. Figure 11 displays confirmed dog and llama losses from 1995–2001.

WS field investigation reports summarize the evidence examined and confirm if wolves were the cause of livestock injury or death. Up until recently, Montana WS personnel did not officially categorize "probable" or "possible" wolf losses. However, these types of losses are now incorporated into field investigative procedures. The number of confirmed wolf-caused losses is expected to underestimate total livestock losses due to wolves because of insufficient evidence, lack of a carcass, or carcass visitation by more than one predator. The potential for unconfirmed and/or undocumented losses is problematic for individual livestock producers because unconfirmed losses are not covered by Defenders of Wildlife, a non-governmental conservation organization which has reimbursed owners for confirmed livestock losses through its privately funded compensation trust fund. It can also be problematic for livestock producers if losses are categorized as probable, because the Defenders of Wildlife compensates probable losses at 50% of the market value.

One study in Idaho examined interactions between wolves and domestic calves within the USFS Diamond Moose Grazing Allotment in central Idaho to evaluate the role of wolf predation on calf survival and movements (Oakleaf 2002). However, in Montana, there are limited sources of information available about wolf-cattle interactions in order to estimate the potential extent of unconfirmed wolf losses. WS investigative reports of wolf complaints may provide some insight. Table 6 indicates the number of domestic animals investigated, but not verified killed or injured by wolves. Some of these animals suffered injuries or death for reasons that, according to the WS agent conducting the investigation, were not wolf related while others may have been injured or killed by wolves, but the evidence is not sufficient to confirm it truly was a wolf.

WS field investigative reports of wolf-related complaints were reviewed for the calendar years 1999-2001 (WS unpubl. data). Those incidents which were noted as obviously caused by something else (e.g. noxious weeds or lightening) were not considered further. The remainder of the investigations that were officially unconfirmed as wolf-caused were tallied as "potential" wolf losses for the purposes of this EIS. Examples of investigative conclusions for "potential" wolf losses were "scavenged" or "undetermined." Defenders of Wildlife payment records were cross referenced to ensure that these "potential" losses were not compensated as "probable" wolf losses. Table 6 summarizes those livestock losses that were officially unconfirmed as wolf-caused by WS, but may have potentially been caused by a wolf. Because the public identified unconfirmed losses as an issue, these data will also be used to estimate economic losses due to unconfirmed losses (see Chapter 4). While even these data probably underestimate actual losses, they are the best available data for Montana at the present time.

Since 1987, Defenders of Wildlife (a conservation organization) has administered a wolf compensation trust to reimburse ranchers in the northern Rockies for confirmed livestock losses caused by wolves. Table 7 shows total payments since 1987. Payments are depicted by state boundary for Montana, Idaho, and Wyoming, irrespective of federal wolf recovery area boundaries. These payments may not fully compensate ranchers for their wolf-related losses to the extent that depredation is underestimated, and to the extent that ranchers incur indirect costs related to wolves such as fence repair and additional costs of managing livestock – wildlife interactions. Economic impacts of confirmed and "potential" livestock losses are addressed in Chapter 4.

Table 5. Summary of the number of wolf-related complaints received and investigated by the U.S. Department of Agriculture Animal and Plant Health Inspection Service Wildlife Services Wolf Depredation Control Program in Montana 1997-2002, according to federal fiscal years (October 1 – September 30). Source: U.S. Department of Agriculture Animal and Plant Health Inspection Service, Wildlife Services, Montana Field Office.

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002 through 7/12/02
Date of first depredation	10/1/96	10/4/97	12/23/98	10/3/99	10/4/00	10/8/01
Total complaints received	40	39	56	55	36	45
Complaints involving livestock	40	39	56	55	36	43
Total complaints verified	13	15	20	19	20	25
Verified complaints involving livestock	13	15	20	19	20	23
Percent of total complaints verified	32.5%	38.4%	36.0%	36.0%	56%	55.5%

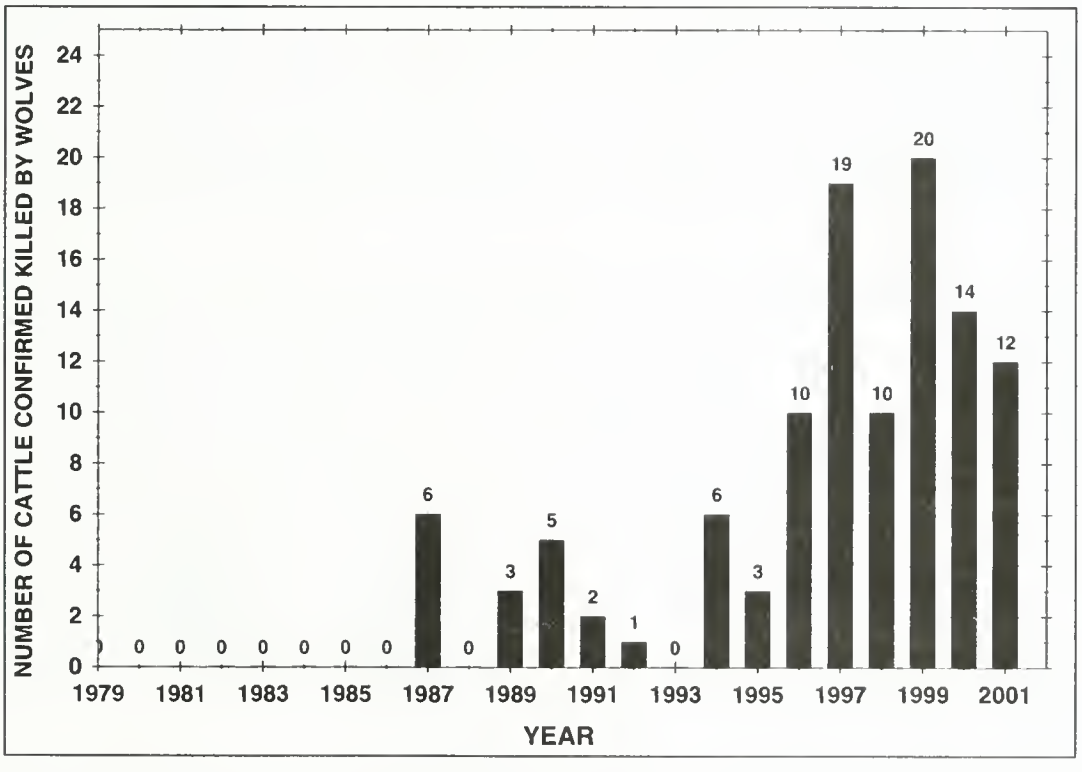

Figure 9. Number of cattle depredations confirmed by Wildlife Services as wolf-caused in Montana, 1980-2001 (USFWS unpubl. data).

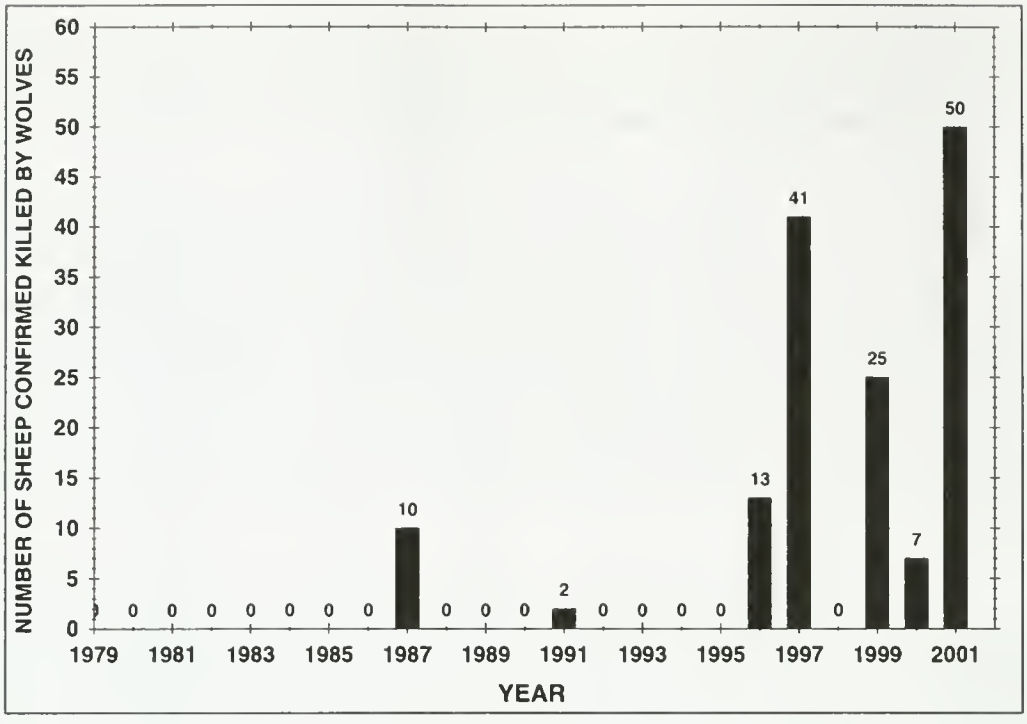

Figure 10. Number of sheep depredations confirmed by Wildlife Services as wolf-caused in Montana, 1980-2001 (USFWS unpubl. data).

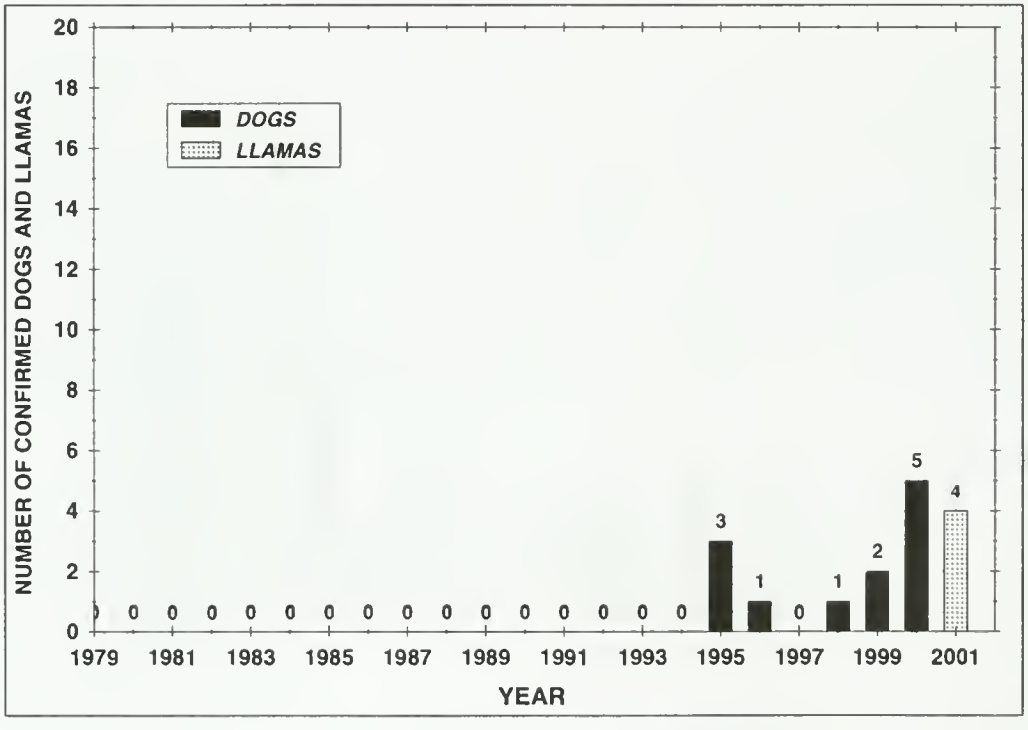

Figure 11. Number of domestic dogs and llama depredations confirmed by Wildlife Services as wolf-caused in Montana, 1980-2001 (USFWS unpubl. data).

Table 6. Livestock losses that were unconfirmed as wolf-caused by Wildlife Services but that could have potentially been caused by wolves, given that the investigation did not document any obvious cause of death or injury such as noxious weeds or lightening, during calendar years 1999-2001 (Wildlife Services, unpubl. data).

Potential Wolf-caused Losses	Calendar Year 1999	Calendar Year 2000	Calendar Year 2001
Cattle	11	8	6
Sheep	2	1	1
Horse/colt	1	3	1
Dog (herding or guarding)	0	2	0

Big Game Hunting

Hunting in general, and especially for big game, is an important activity for many Montana residents. The 2001 National Survey of Fishing, Hunting, and Wildlife-associated Recreation found that residents spent over two million days hunting within the state in 2001 (USFWS and U.S. Department of Commerce 2002). Additionally, 97% of residents' total hunting days in 2001 were spent hunting within the state. Of all hunting opportunities, elk and deer hunting are some of the most highly valued, both in terms of total days spent hunting, and total expenditures by resident and non-resident hunters within the state. The number of elk hunters and hunter days in Montana has increased steadily through time (Figure 12). The number of hunters and hunter days are more variable for deer (Figure 13). Compared to deer and elk, opportunities to hunt moose are limited, but they are highly sought primarily by residents (Figure 14). Hunter success and total harvest vary, sometimes significantly, from year to year. Fluctuations are primarily due to hunting conditions during the season, changes in general regulations and antlerless opportunity, hunter access, changes in population status, and hunter success in previous seasons are also influential.

Big game hunters in Montana are concerned about the potential for big game population declines and subsequent declines in hunter opportunity due to wolf predation on ungulates. Hunters in Montana enjoy greater opportunity now than even 20 years ago. Since 1990, the hunting regulations, thus, hunter opportunity, for antlered males have been relatively consistent for deer and elk. In recent years, more specialized regulations were adopted to provide opportunities for larger-antlered, mature males for mule deer and elk in certain hunting districts. Hunter opportunity for antlerless elk has also been relatively stable statewide. The number of permits at the individual hunting district level varies through time. Opportunity has significantly increased in some localized areas consistent with management objectives to reduce elk populations through the expanded use of A-7 antlerless elk licenses in conjunction with antlerless elk permits. In other localized areas, antlerless elk opportunity has declined. Hunter opportunity for antlerless deer reflects a number of factors, including deer population status, fawn recruitment trends, and management objectives. The long term trend in the number of moose permits available is relatively stable, with the greatest fluctuation in FWP Region 1 (Table 8).

FWP used data collected through the telephone harvest survey to examine long term trends in elk and deer hunting participation at the FWP regional scale. Data from 1990-2001 were divided into two time periods (1990-94 and 1995-2001) to correspond to increasing numbers of wolves in northwestern Montana and wolf reintroduction into YNP and central Idaho. Significant events also occurring in that

time span include the severe winter of 1996/97, large summer forest fires, especially favorable hunting conditions in 1994, an overhaul of mule deer management, and other smaller regulation changes. The methods used to estimate hunter numbers changed in 1996, so the data for 1990-94 may be slightly over-estimated compared to 1995-2001. The average the number of elk hunters and the average number of elk hunter days in the early 1990s was about the same as the late 1990s (Figures 15 and 16). Although the exact number changes from year to year, there are no trends upward or downward. The number of deer hunters and deer hunter days is much more variable year to year. The long term averages are also variable and are generally lower in the late 1990s compared to the early 1990s across most FWP regions (Figures 17 and 18). This likely reflects real declines in mule and white-tailed deer populations due to environmental events and the resultant changes in regulations, particularly for mule deer. Hunter participation is affected by a host of factors beyond just the presence of a recovered wolf population.

The diet of gray wolves in Montana is expected to be primarily white-tailed deer, mule deer, elk and moose. While other ungulate species or small mammals may also be taken, they are expected to be a minor portion of the total diet. The actual proportion of whitetail and mule deer, elk, and moose will vary in part based on prey availability and relative prey vulnerability. In northwestern Montana (FWP Region 1 and a portion of Region 2), wolves are expected to prey primarily on white-tailed deer, elk, and moose (Kunkel 1999). The white-tailed deer is the primary ungulate species sought by human hunters as well. Figure 19 shows long term trends in FWP Region 1 white-tailed deer hunting. Figure 20 shows long term trends in FWP Region 1 elk hunting.

Table 7. Payment from the Defenders of Wildlife Bailey Wildlife Foundation Wolf Compensation Trust Fund (rounded to nearest dollar) for confirmed livestock losses or injuries caused by wolves, 1987-2001, in Montana, Idaho, and Wyoming (see www.defenders.org/wolfcomp.html).

Calendar Year	Montana	Idaho	Wyoming
1987	$3,049		
1988	none		
1989	$1,730		
1990	$4,700		
1991	$1,250		
1992	$374		
1993	none		
1994	$2,322		
1995	$1,633	none	None
1996	$3,506	$3,977	None
1997	$16,495	$3,761	$12,434
1998	$4,810	$6,380	$500
1999	$12,063	$15,794	$4,975
2000	$7,935	$24,773	$14,339
2001	$21,274	$9,627	$17,454
Total, all years	$81,141	$64,312	$49,684
Average per year since reintroduction (1995-2001)	$9,674	$9,187	$7,098

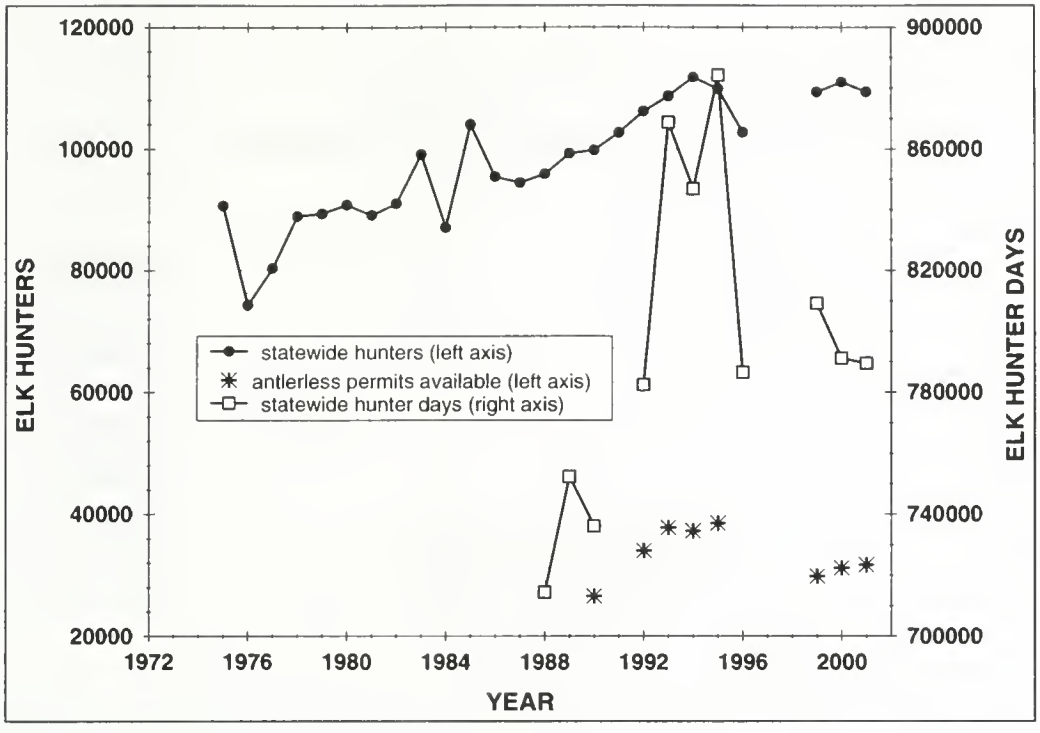

Figure 12. Total number of elk hunters, elk hunter days, and number of antlerless permits available in Montana, 1975-2001.

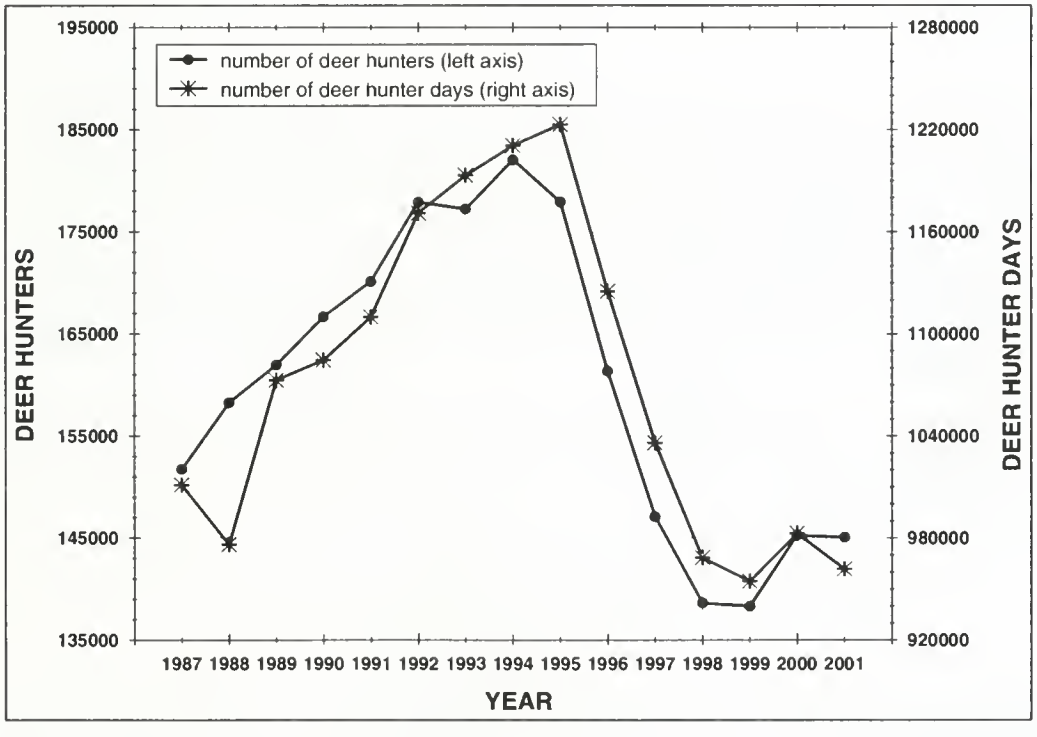

Figure 13. Total number of deer hunters and total hunter days for white-tailed deer and mule deer combined in Montana, 1987-2001.

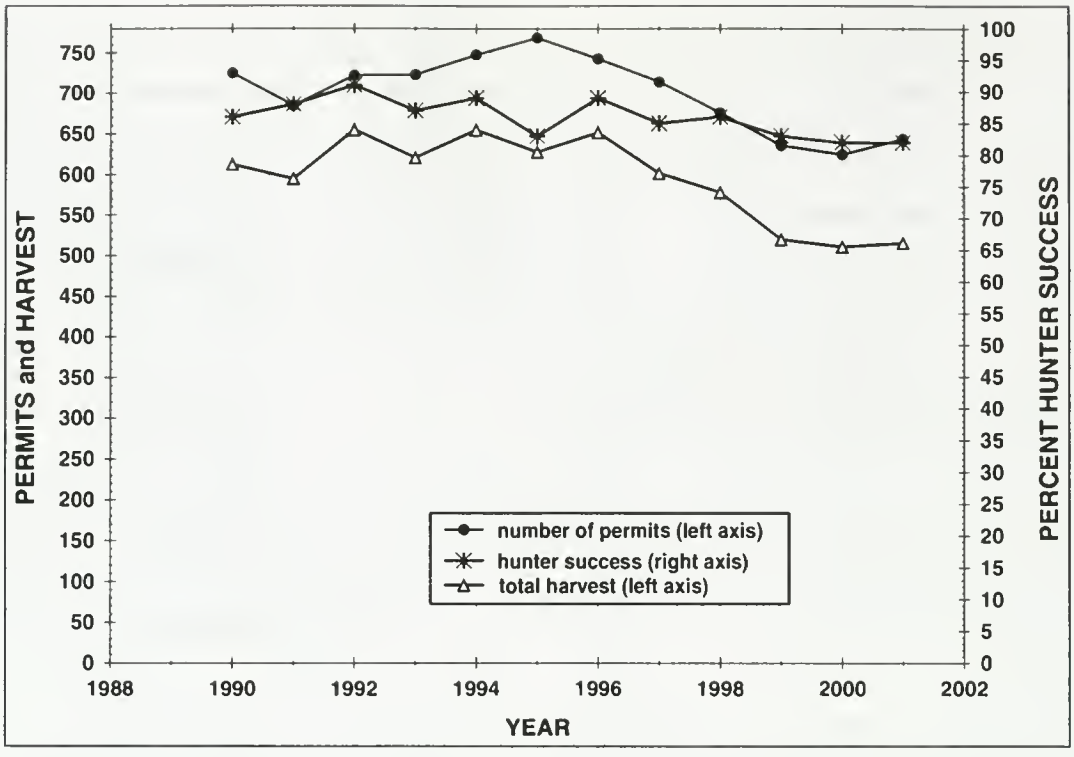

Figure 14. Total number of moose permits available, hunter harvest, and moose hunter success in Montana, 1990-2001.

Table 8. Average number of moose permits available in Montana Fish, Wildlife & Parks Regions 1-5 for 1995-2001. One standard deviation from the average (an indicator of how much the actual number varies through time) is shown in parentheses.

Montana Fish, Wildlife & Parks Region	Average Number of Permits (+/- 1 standard deviation)
Region 1	190 (+/- 59)
Region 2	75 (+/- 6)
Region 3	373 (+/- 12)
Region 4	10 (+/- 2)
Region 5	36 (+/- 4)

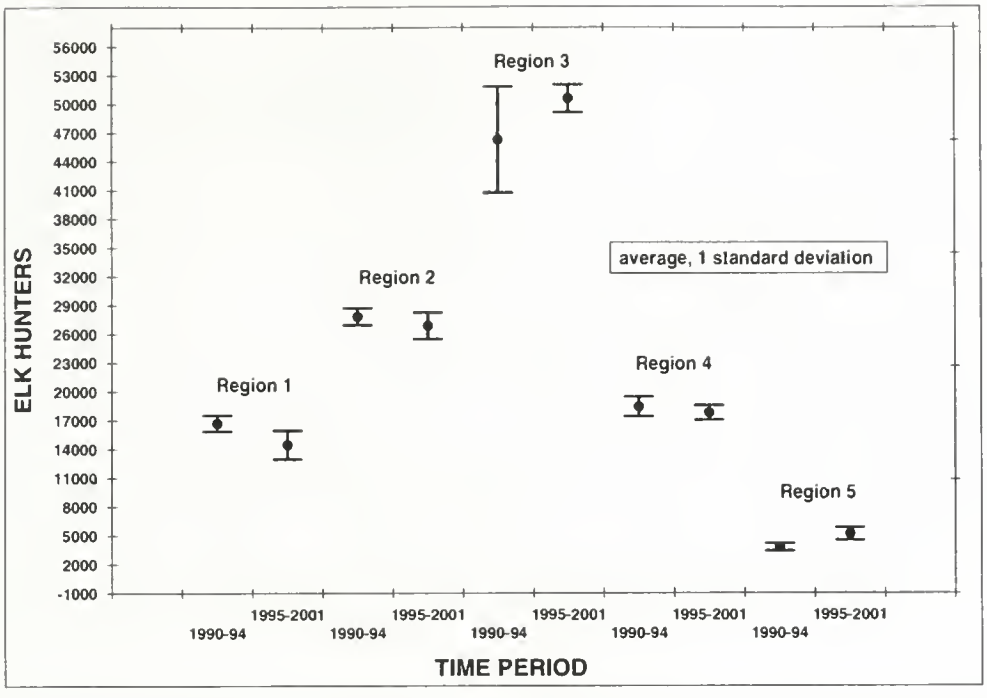

Figure 15. Average number of elk hunters for Montana Fish, Wildlife & Parks Regions 1-5 for two time periods 1990-1994 and 1995-2001. Standard deviation (an indicator of how much the actual number varies through time) brackets the average.

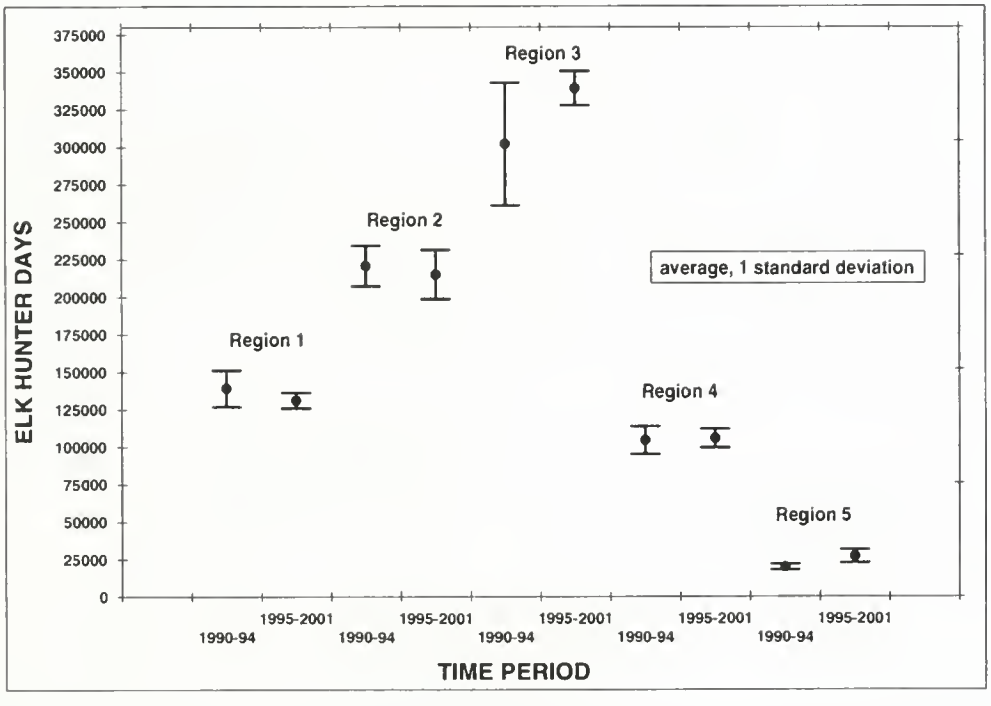

Figure 16. Average number of elk hunter days for Montana Fish, Wildlife & Parks Regions 1-5 for two time periods 1990-1994 and 1995-2001. Standard deviation (an indicator of how much the actual number varies through time) brackets the average.

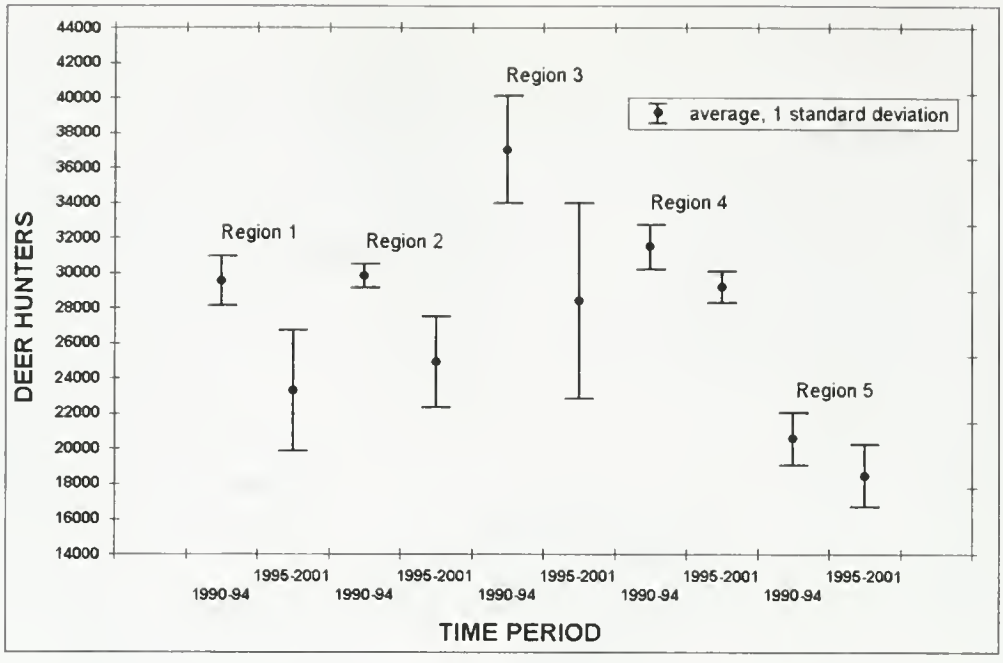

Figure 17. Average number of deer hunters for Montana Fish, Wildlife & Parks Regions 1-5 for two time periods 1990-1994 and 1995-2001. Standard deviation (an indicator of how much the actual number varies through time) brackets the average.

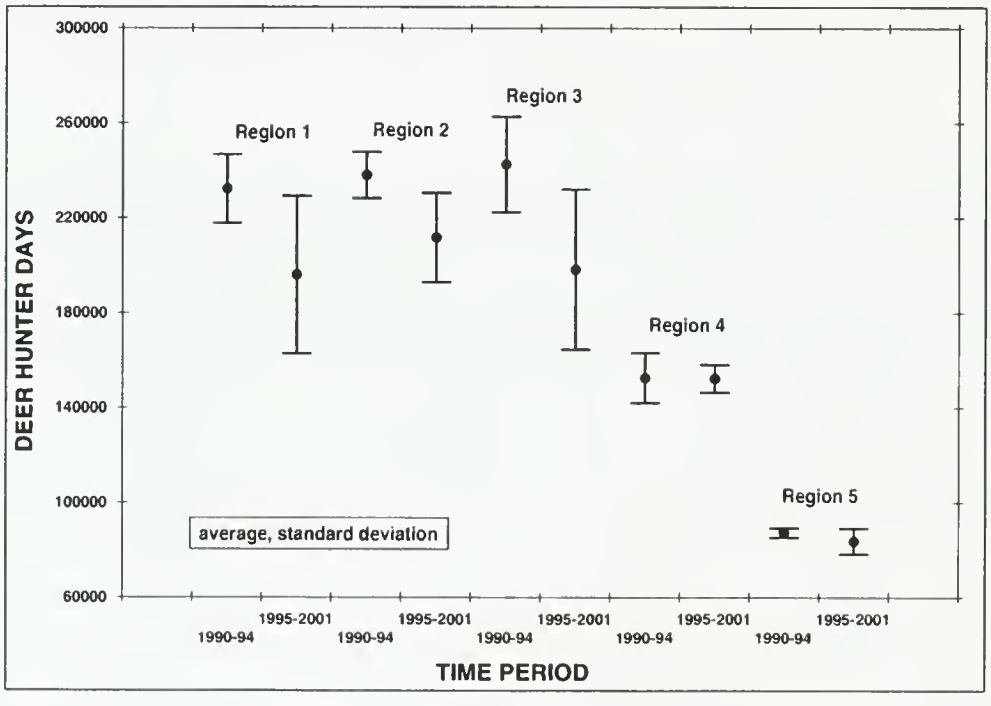

Figure 18. Average number of deer hunter days for Montana Fish, Wildlife & Parks Regions 1-5 for two time periods 1990-1994 and 1995-2001. Standard deviation (an indicator of how much the actual number varies through time) brackets the average.

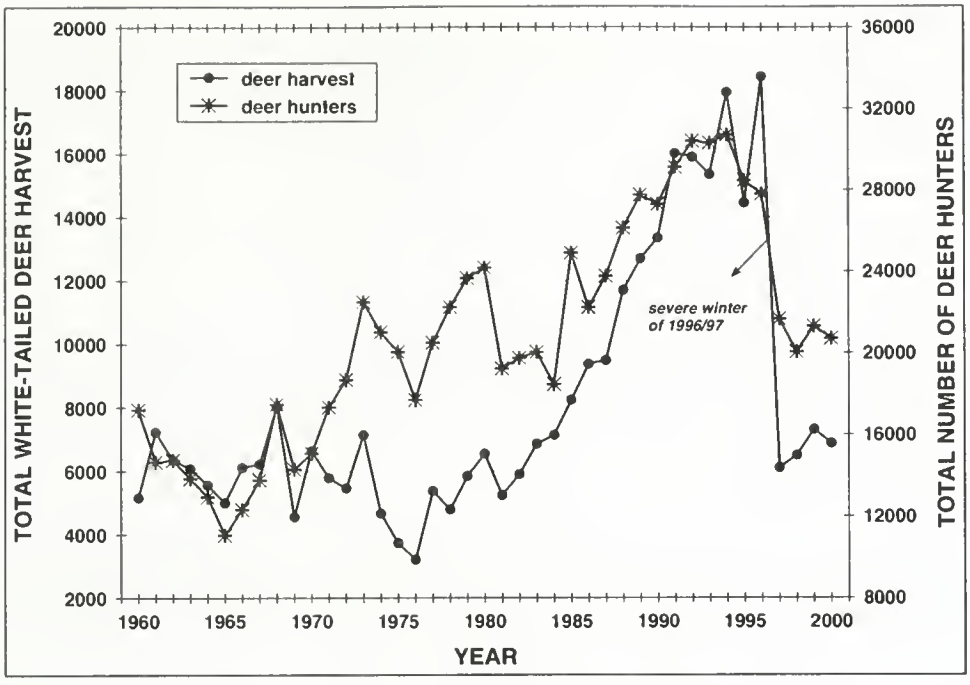

Figure 19. Montana Fish, Wildlife & Parks Region 1 white-tailed deer harvest and number of deer hunters, 1960-2000.

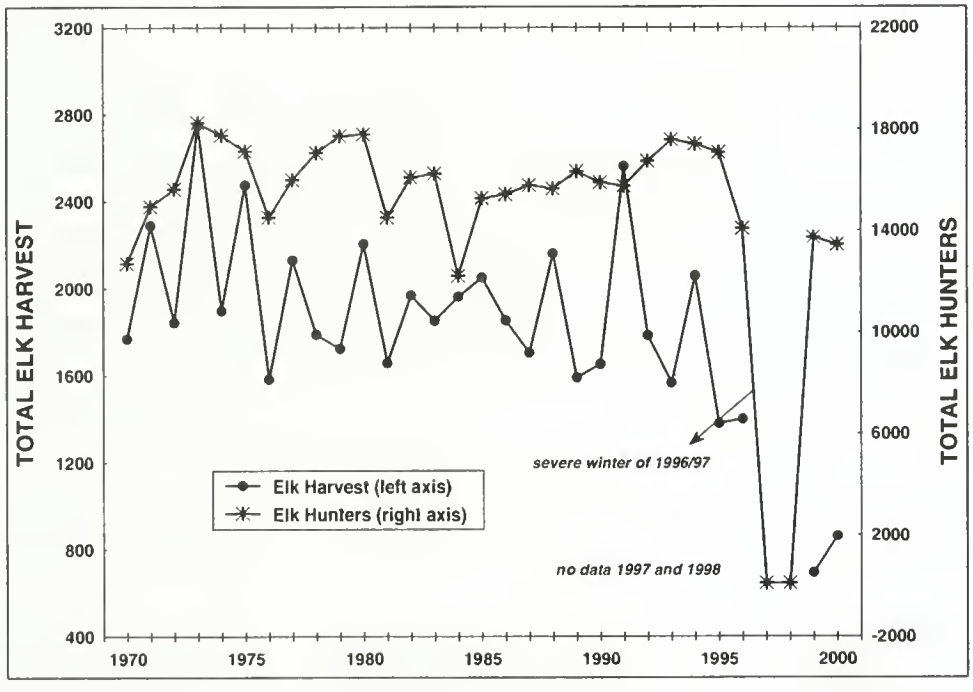

Figure 20. Montana Fish, Wildlife & Parks Region 1 elk harvest and number of elk hunters 1970-2000. Hunter opportunity for bull elk was reduced through adoption of the more restrictive "brow-tined bull" regulation in 1997-98 from the previous "antlered bull" regulation.

In other areas of the state, wolves are expected to prey primarily on elk, mule deer, and moose. In southwestern Montana, wolf packs seem to prey on elk more frequently than mule deer or moose (Smith et al. 2001; Gude and Garrott unpubl. data). Of the three species most likely to be killed by wolves in the Yellowstone area, elk are the most closely studied. Elk are important to human hunters as well.

The northern Yellowstone elk herd has always gotten a great deal of public attention because it is one of the largest and best known elk herds in the country, it is associated with YNP, and it provides a unique and very popular elk hunting opportunity during the so called "Gardiner late elk hunt." Since the 1970s, the northern Yellowstone elk herd has fluctuated up and down from less than 9,000 elk to about 19,000 elk, based on winter counts. The annual winter count changes 10-20% from year to year, but sometimes it changes by 30-40%. Compared to other Montana elk populations, northern Yellowstone herd counts are dynamic and very chaotic. During this same period, elk herds in other parts of southwestern Montana that are managed primarily by hunting, fluctuated 5-15% per year, with a clear long term trend toward increasing elk numbers. Most elk herds in southwestern Montana currently have two to four times as many elk now as they had in the mid-1970s.

Periodic, but significant winterkill events are the greatest single factor affecting elk numbers in the northern herd, with the last two occurring in 1989 and 1997. Winterkills of such magnitude do not occur in other Montana elk populations, even in severe winters. Yellowstone elk are predisposed to higher winter mortality due to harsher winter conditions, an older age structure in the population, high elk densities, and lack of an agricultural forage base to fall back on during hard winters.

Historically, northern range elk counts do not exhibit clear, long term trends. The northern herd has been surveyed from the air since 1967. Beginning in more recent years, two surveys are conducted – one in December and one in the spring. The purpose of the December survey is determine overall population trends by counting total elk numbers, using four fixed-wing aircraft simultaneously. These surveys yield trend information and are flown at the same time each year, regardless of counting conditions so that the count itself becomes an index to reflect changes in the elk population over time. The total count in December 2002 was 9,215 elk, with approximately 75% of the herd inside YNP. The previous count in December 2001 was 11,969, compared to a long term average of 13,846 elk from 1968-2002 (Table 9) (FWP 2002). Poor counting conditions likely contributed to an under count of the actual number of elk in the northern Yellowstone population for the 2002 count. Lack of snow cover, the wide distribution of elk at higher elevations, and difficulty in detecting elk were noted by observers. In previous instances of poor counting conditions, the previous or the following year's trend estimate were more consistent with long term averages. However, biologists concluded that the December 2002 data suggest that elk abundance has decreased since 1988 (Northern Yellowstone Cooperative Wildlife Working Group, 2003). Factors contributing to the decrease likely include predation, drought-related effects on pregnancy and calf survival, periodic substantial winterkill owing to severe snow pack, and human harvest during the Gardiner area late hunt. The second survey is flown in the spring (usually March) to determine how many elk wintered north of YNP and Dome Mountain and to classify the elk population to obtain an estimate of calf recruitment, expressed as the number of calves observed for every 100 cows (calf:cow ratio) (Table 9).

The northern herd demonstrates the natural ability to recover from periodic population declines. The most significant recovery started in 1968, following the end of deliberate elk reductions inside YNP and the end of largely unregulated elk hunting. The population increased from about 3,200 elk to over 12,000 just eight years later. Elk numbers have since recovered from major winterkills within five to six years. Wolves, however, are a new and significant source of mortality that will reduce total elk numbers. The exact extent of those overall population reductions, how wolf predation affects population growth rates, and the variation from year to year is unknown. FWP is concerned that during severe winters, more elk will be vulnerable to predation, and the combination of winterkill and predation could be significant.

FWP is also concerned about calf recruitment. There are early indications that the number of wolves that prey on the northern Yellowstone elk herd has leveled off because wolves may have reached their social and biological carrying capacity for area. Overall elk herd dynamics are largely influenced by environmental factors and predation dynamics that occur inside YNP boundaries. FWP's management of the portion of the herd that winters in the State of Montana north of YNP and the focus of the Gardiner late hunt will need to take that into consideration. Monitoring efforts are an important part of that management, particularly for determining the number of migrant, YNP elk wintering north of Dome Mountain.

While there are many factors that affect elk herd numbers and distribution (i.e. winter severity, weather during hunting season, drought conditions, and hunter pressure), the available data on the northern Yellowstone elk herd suggest that current herd size, hunter effort and hunter success are within the general ranges seen before the reintroduction of wolves. Data indicate that the late winter 2002 calf recruitment estimate (14 calves counted for every 100 adult cows) was a record low. Just like total elk numbers, calf recruitment in Yellowstone varies widely from year to year, ranging from 14-48 calves/100 cows, with an average of 32 calves/100 cows. However, across almost all areas of elk habitat in Montana, with a few exceptions, have experienced declines of 30-50% from the historical averages of the calf/100 cow ratios. This includes the elk population in the Missouri River Breaks. Recruitment in Yellowstone elk is typically lower than most elk populations in neighboring herds in southwestern Montana. Reasons for lower recruitment in Yellowstone elk include higher predation rates in a predator-rich environment that now includes wolves, lower pregnancy rates, an older age structure in female segment of the herd, long stressful winters, and the general physical condition of elk which varies with forage availability and quality. In recent years, persistent drought conditions have also affected overall herd health and condition, as well as recruitment rates. Long term studies are required to understand wolf effects on ungulates. Extensive studies of this wolf/ungulate relationship are now underway both within and outside YNP.

FWP administers the Gardiner late hunt to help manage elk numbers on winter ranges north of YNP. FWP's management objective is to provide winter range forage for migrant Yellowstone elk on a sustainable basis by managing elk numbers so they do not exceed the carrying capacity of the winter range and cause long term changes in plant communities or declines in forage production. To accomplish this, hunters are used as a management tool to help regulate the number of elk wintering north of the YNP boundary, by annually harvesting a portion of the migrant population. The number of antlerless elk permits available for the Gardiner late hunt changes through time, based on winter population counts, recruitment, previous hunter success, hunter participation, and the number of elk migrating to winter range north of YNP. The number of migrant elk available to hunters during the late hunt, thus hunter success, depends heavily on winter weather conditions that determine the timing and the size of elk migrations (FWP 2001b).

Elk hunting is also popular in other areas of southwestern Montana outside the Yellowstone area. Management objectives for many elk herds in southwestern Montana call for reducing total elk populations. Antlerless harvest opportunities have been liberalized in recent years where elk populations are exceeding social carrying capacity. Table 10 summarizes elk hunting information in FWP Region 3. As noted above, many different factors can affect herd population numbers and distribution. Similarly, many factors affect hunter harvest, independent of elk numbers. Weather, changes in hunting regulations and special permit availability, and human population changes in the region can all influence hunter success.

Outfitted Hunting. Outfitted hunting is significant and economically important to big game hunting in Montana. In the 2000 and 2001 hunting seasons, over 10,000 hunters used the services of a hunting outfitter. The majority of these guided hunters come to Montana from out-of-state, purchasing

nonresident hunting licenses and special permits. Only 1.5% of resident elk hunters utilize the services of an outfitter (King and Brooks 2001). Table 11 details the number of clients served (residents and non-residents) by outfitters for all species of big game hunting between 1995 and 2001. Outfitted big game hunting in Montana was relatively stable during that time.

Table 9. Summary of Northern Yellowstone Elk Herd population and late season harvest data, 1968-2002. Source: 2002 Gardiner Late Elk Hunt Annual Report, Montana Fish Wildlife and Parks (Table 9).

	2002	2001	2000	Last 5-year average (1998-2002)	Last 10-year average (1993-2002)	Long Term Average[a] (1968-2002)
Aerial Elk Count	11,969	13,400	14,538	12,668	13,908	13,846
Elk Migration north of Yellowstone National Park	5,104	3,833	3,500	4,753	5,260	5,207
Calves per 100 Cows (aerial survey)	14	29	23	24	27	32
Gardiner Late Hunt Harvest	1,103	1,221	940	1,233	1,363	1,095
Number of Permits	2,496	2,506	3,002	1,626	2,758	2,306
Hunter Success	56%	63%	42%	58%	63%	64%

[a] Long term trends vary by statistic due to differing availability of long term data.

Table 10. Montana Fish, Wildlife & Parks Region 3 elk hunting information, 1990-2001. No data are available for 1991, 1997 and 1998.

Year	Hunters	Hunter Days	Hunter Success	Bull Harvest	Antlerless Permits	Antlerless Harvest	Total Harvest
1990	38,590	248,367	23.0	4,248	13,484	4,691	8939
1991							
1992	46,475	291,878	28.9	5,739	16,391	7,697	13,443
1993	48,323	333,677	30.0	4,661	19,321	5,009	9,686
1994	51,653	334,229	34.1	7,391	20,803	10,279	17,602
1995	52,023	352,276	21.2	4,674	22,313	6,378	11,054
1996	48,944	326,135	36.0	7,057		10,619	17,676
1999	49,521	344,933	19.5	4,286	21,898	6,301	9,652
2000	52,139	344,264	30.0	6,750	20,993	11,417	15,641
2001	50,175	328,137	19.9	4,504	16,727	5,483	10,000

Table 11. Outfitter-reported total number of clients served on hunts for all big game species in northwestern Montana (Flathead and Lincoln counties) and southwestern Montana (Gallatin, Beaverhead, Sweet Grass, and Madison counties), 1995-2001. The totals include big game hunting clients served per year for both those clients buying licenses through the outfitter-sponsored license quota and those buying licenses on their own (non-sponsored). Source: Montana Board of Outfitters, Hunting Statistics.

Year	State of Montana		Northwestern Montana		Southwest Montana	
	Sponsored Non-Residents	Non-Sponsored[a]	Sponsored Non-Resident	Non-Sponsored[a]	Sponsored Non-Resident	Non-Sponsored[a]
1995	--	--	248	22	1,572	245
1996	8,235	858	307	16	1,791	273
1997	7,112	1,057	299	40	1,787	309
1998	7,032	1,148	424	25	1,638	393
1999	7,060	1,537	320	43	1,568	702
2000	7,875	2,327	429	126	2,017	709
2001	7,393	2,845	337	253	2,160	1,183

[a] Non-sponsored is the total of non-residents and residents who buy licenses on their own but who utilize the services of an outfitter during the big game hunting season. Non-sponsored totals may be slightly over-estimated because single clients could have hunted more than one species and may be tallied for each species hunted.

Regional Economics

Human Population. In 2000, Montana's population was 902,000 people. The population grew at a rate of about 12.9% between 1990 and 2000. Montana is sparsely populated compared to the entire country. There were an average of 6.2 people per square mile in 2000 - compared to 79.6 people per square mile in the United States as a whole. About 13 percent of the population in Montana is age 65 or older, slightly higher than in the United States as a whole (U.S. Census Bureau, State and County QuickFacts: http://quickfacts.census.gov).

Montana is rich in outdoor recreation opportunities. The state boasts national and international, recognition for its national parks, extensive wilderness areas, and high quality hunting, fishing, and wildlife viewing opportunities. Not surprisingly, residents of the state (and the three state region of Montana, Idaho, and Wyoming) value outdoor recreation highly. In a 1992 study, Duffield et al. (1993a) found that 79% of the people who live in the 20 counties immediately surrounding YNP (including the contiguous states of Idaho and Wyoming) participated occasionally or frequently in outdoor recreation activities, compared to 69% of people nationwide. GYA residents had higher rates of participation in fishing (73%, compared to 48% nationwide), viewing wildlife (90%, compared to 67%), and hunting (60%, compared to 25%). Not surprisingly, GYA residents were more likely to have hunted deer, elk, or moose, and were much more likely to have hunted these species in Idaho, Montana, or Wyoming than were residents of the U.S. as a whole.

The Montana Economy. In 1997, Montana per capita personal income was $19,660, having grown 5.5% since 1987 (U.S. Department of Commerce, Bureau of Economic Analysis 2002). Total personal income in the state was $17.3 billion in 1997.

The economic sectors most likely to be affected by wolf restoration are agriculture and tourism, including outfitting related to hunting and eco-tourism/wildlife viewing. Table 12 shows the key economic sectors (types of business producing similar goods and services) broken out at the finest level of detail available. Farm output (the total value of goods and services produced) accounts for approximately 6.3% of total state output. Farm income accounted for about 2% of the total personal income in the state, and livestock accounted for 48% of the value of farm products sold in the state in 1998 (Montana Agricultural Statistics Service 1999).

Tourism is also important "industry" in Montana. Visitors come to Montana in large numbers year round to see parks and wilderness areas, ski, float rivers, fish, hunt, and simply enjoy scenery. While they're here, these visitors spend large amounts of money for food, lodging, license fees, guide fees, and gifts among other recreation-related spending. These expenditures, in turn, have a large impact on incomes and employment in the region. Duffield et al. (2001) found that visitors to YNP who came from outside the three-state region of Montana, Idaho and Wyoming spent an average of $680 per person in the three states for winter visits in the region and $291 per person while on summer trips. Economic activity associated with tourism is captured by a number of sectors, including transportation services, hotels and other lodging, recreation services, and retail trade (Table 12). However, these sectors also include economic activity not specifically tied to tourist spending, so it is difficult to extract the total percentage of state economic output associated with tourism from Table 12. Nonetheless, the tourism industry is consistently ranked in the top three industries (as measured in total output).

Outfitting of all kinds, including fishing, hunting and ecotourism are combined into the recreation services sector of Montana's economy. This also includes skiing and other tourist services. Both big game hunting and outfitting services have a strong link to the level of economic activity through hunter expenditures. The 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation found that U.S. residents spent $216 million in Montana on hunting trips, equipment, and licenses (USFWS and U.S. Department of Commerce 1998). USFWS estimated that of hunting-related expenditures within Montana, $182 million was spent specifically for hunting trips and equipment. About 69% of this, or $126 million, was specifically spent for big game hunting. Of the total hunting trip-related spending in Montana in 1996, nonresidents spent 65% of the total (Table 13). FWP studies have demonstrated that trip-related hunting expenditures are even higher than the national survey results. Residents and nonresidents spend an average of $186.9 million on their hunting trips in Montana annually (Duffield and FWP 1988). Approximately 45% of those expenditures are by nonresidents.

Non-hunting outfitting appears to be increasing in Montana, particularly for visitation in Montana's national forest roadless or wilderness areas. (Adams 2000). According to a 1998 survey of outfitters using these wildland areas, hunters accounted for less than 14% of all clients and a fifth of their service days. A similar survey published in 1990 found that in the Montana commercial outfitting industry as a whole, 24% of clients were hunters (Taylor and Reilly 1990). Possible explanations for the shift include changing interests in outdoor recreation away from hunting, thus changing consumer demand, and a need for outfitters to generate income during other seasons of the year. Those non-resident clients who do not hunt but utilized the services of a wildland outfitter for outdoor recreation (e.g. wildlife viewing, or photography) spent $37.2 million for food/lodging, transportation, and outfitter fees in Montana in 1998 (Adams 2000).

Table 12. State of Montana, Output, Employment and Income: 1999. Industry output is reported in millions of 1999 dollars. Source: Minnesota IMPLAN Group 2002.

Industry	Industry Output	Employment	Employee Compensation	Proprietor Income
Farms	2,385	32,009	137	289
Forestry Products	78	1,001	4	7
Ag Services	125	4,798	23	33
Metal mining	331	1,939	107	(18)
Coal Mining	257	970	65	14
Oil mining	253	2,058	46	18
Non-metal mining	111	951	41	0
Construction	3,766	39,527	778	380
Food processing	819	2,848	82	1
Textiles	2	24	0	0
Apparel	69	717	7	1
Wood products	1,455	8,827	268	31
Furniture	72	871	13	4
Pulp and paper	327	810	45	3
Printing and publishing	308	3,525	84	3
Chemicals and allied	234	712	29	5
Petroleum products	1,554	909	63	2
Rubber products	62	429	11	0
Leather products	4	103	1	0
Stone, glass and clay	212	1,244	38	4
Primary metals	270	1,101	50	15
Fabricated metal	100	1,159	28	2
Industrial machinery	419	2,109	61	2
Electrical equipment	79	474	16	1
Transportation equipment	113	596	21	1
Scientific instruments	52	370	13	1
Miscellaneous mfg	167	1,963	43	1
Railroads and Related Services	499	2,902	192	0
Local- Interurban Passenger Transit	63	1,820	24	4
Freight Transport and Warehousing	968	9,353	192	109
Water Transportation	12	81	1	0
Air Transportation	200	2,539	82	3
Pipe Lines- Except Natural Gas	56	110	7	0
Transportation Services	65	1,511	30	8
Communications	726	4,040	144	27
Utilities	1,025	3,070	169	12
Wholesale Trade	1,623	20,683	630	40
Retail Trade	3,402	104,190	1,379	159
Banking	1,024	6,839	208	6
Credit Agencies	146	3,878	70	7
Security and Commodity Brokers	171	1,441	83	17
Insurance Carriers	284	2,630	97	0
Insurance Agents and Brokers	198	5,102	81	36
Real estate	2,222	12,948	70	108
Hotels and Lodging Places	405	11,600	149	12
Personal services	247	10,360	53	55
Business services	1,023	22,913	299	154
Automotive services	477	7,066	102	52
Repair services	199	3,729	36	27
Motion Pictures	123	1,832	18	5
Recreation services	366	13,272	94	56
Health services	2,508	42,919	1,190	231
Legal Services	254	4,280	116	65

Table 12. Continued

Industry	Industry Output	Employment	Employee Compensation	Proprietor Income
Education services	185	7,053	83	7
Social services	447	11,839	189	0
Non-profit organizations	627	11,392	185	1
Professional services	960	19,734	334	104
State & local non-ed government	1,342	25,856	820	0
Federal non-military	913	17,647	721	0
Special sectors	(180)	0	0	0
Federal Government - Military	501	8,563	290	0
State & Local Government, Education	1,028	35,451	1,028	0
Domestic Services	28	3,588	28	0
Totals	37,763	554,276	11,266	2,102

Table 13. Summary of expenditures associated with hunting in Montana by all U.S. Residents, 1996. Source: USFWS and U.S. Department of Commerce 1998, Table 15. Not all expenditure items are included in the table, so the items shown will not sum to the total.

Expenditure Item	Amount ($1000s)	Average per Hunter
Total spending	215,878	954
Food and lodging	44,043	226
Transportation	36,244	186
Other trip costs	19,318	99
Equipment costs	45,764	207
Licenses and land leasing and ownership	31,007	159

Recreational and Social Values

Hunting Values. Wolves have the potential to influence several types of recreation, including hunting and tourism. The net economic values that an individual places on these recreational experiences have been estimated on a per-trip or per-day basis in a number of studies. This net economic value (sometimes referred to as willingness to pay) is the additional amount of money hunters and other recreationists say an activity is worth over and above actual expenditures. Expenditures commonly include transportation costs, lodging, food, guide fees, and other purchases, excluding license fees. Nonresidents place substantially higher values on their hunting-related recreational experiences in Montana than residents (Table 14). An examination of nonresident big game license sales (discussed below under FWP Fiscal) shows that nonresident hunting values are substantial based on their willingness to pay for the license fees (up to $1,100) for the right to hunt deer and elk in Montana. Data from a 1992 survey of outfitter fees paid for hunting on private land also tend to show substantial value attached to hunting in Montana (Duffield et al. 1993b). For the relatively small subsample of outfitters who paid landowners on a per-animal-harvested or per-hunter basis (as opposed to the more common lump sum rental for a season's access), the per-animal charges were between $50 and $200 while the per hunter charges were between $10 and $1000.

Table 14. Comparison of net economic value (NEV) per day estimates for Montana deer and elk hunting trips (in current 2002 dollars). Sources: Duffield and Neher (1990) and King and Brooks (2001) for deer and elk, respectively.

Species	NEV/day for Montana Resident Hunters	NEV/day for Nonresident Hunters
Deer	$74.00	$102.44
Elk	$109.00	$116.00

Wildlife Viewing Values. Visitors to Montana often cite wildlife watching as an important aspect of their trips to the state. As with hunting, studies have also estimated the net economic value of a day of watching wildlife. USFWS estimated that within the USFWS region containing Montana, residents spend an average of 10.5 days per year engaged in wildlife viewing. USFWS further estimated that the net economic value of wildlife viewing in the region containing Montana is $31 per day (USFWS and U.S. Department of Commerce 1998).

Relatively more is known about the wildlife viewing values of visitors to YNP than about visitors to GNP or Montana as a whole. Visitors entering YNP from Montana in 1999 cited wildlife viewing as a primary activity during their trip. Overall, 62.1% of winter park visitors and 94.9% of summer park visitors listed wildlife viewing as an activity (Duffield et al. 2001). Surveys of both winter and summer visitors to YNP have also consistently shown that the gray wolf is one of the species which visitors desire to see the most (Table 15). Interestingly, grizzly bears are some of the most rarely seen of all species in the park (Duffield et. al 2001). However, frequently seen species are also in the top 10 list, such as bison, elk and bighorn sheep. These findings suggest that visitors have well-defined preferences for wildlife viewing and that preferences across winter and summer visitors are similar.

Table 15. Wildlife species visitors to the Greater Yellowstone Area would most like to see, in order of preference. Preference is measured as the percentage of respondents who cited a species as one of the top three species they would most like to see on their trip. Rank is shown in parentheses. Source: Duffield et al. 2001.

Species	Winter Visitors	Summer Visitors
Grizzly Bear	36.0% (2)	58.0% (1)
Wolf	41.1% (1)	36.0% (2)
Moose	31.2% (4)	35.0% (3)
Mountain Lion	31.9% (3)	31.0% (4)
Black Bear	12.8% (9)	29.0% (5)
Elk	26.1% (5)	14.0% (9)
Bison	27.6% (6)	19.0% (8)
Bighorn Sheep	25.0% (7)	23.0% (6)
Bald Eagle	22.1% (8)	21.0% (7)
Wolverine	11.9% (10)	6.0% (10)
Trumpeter Swan	6.3% (11)	4.0% (11)
Sample Size	1127	1302

Recreational Trip Values. Two of the nation's premier national parks (Yellowstone and Glacier) are found, at least partly, within Montana. A number of studies documented the popularity of these parks as tourist destinations, both nationally and internationally. A 1999 summer visitor survey for YNP found that Montana, Wyoming, or Idaho residents placed a net economic value of $56.80 for their summer trips and nonresidents placed a value of $349.09 on their trips (Duffield et al. 2000).

The 1999 YNP winter and summer surveys also asked visitors whether the possibility of seeing wolves had affected their decision to visit the GYA (Table 16). Nineteen to 42% of visitors reported that seeing or hearing wolves was one of the reasons for making their trip to the GYA. However, a substantial majority would still have made the trip to the GYA if wolves were not present. Approximately 3.5% of current visitors to the park would not make the trip if wolves were not present in the park. Given that there are over three million visitors annually to YNP, it represents over 100,000 visitors.

Table 16. Percent of respondents who reported whether the possibility of seeing wolves affected their decision to visit the GYA. Source: Duffield et al. 2001.

Question/ Response	Winter	Summer	
		Residents	Nonresidents
Was seeing or hearing wolves one of the reasons for making the trip to the GYA?			
Yes	35.9%	41.6%	42.0%
No	64.1%	58.4%	58.0%
Sample size	1,143	221	1,070
If yes, would you still have made this trip even if wolves were not present in the GYA?			
Yes	76.1%	73.9%	80.1%
No	10.2%	8.7%	7.9%
Not sure	13.7%	17.4%	12.0%
Sample size	551	92	443

Social and Cultural Values. Wolf recolonization in northwestern Montana and the reintroduction of wolves into YNP and central Idaho raise a number of issues, including their place in the ecosystem and their effects on people and other animals. Because public comments were used to develop the alternatives for this EIS and to assess their consequences, public issues and concerns are integrated throughout the draft EIS. The purpose of this section is to discuss the social and cultural attitudes and values that underlie the public comments, and to lay the groundwork for assessing how cultural values and the social environment could be affected by the various alternatives.

When discussing social and cultural implications associated with wolves, the primary affected environment is the values of people living within or near the recovery areas and the values of people statewide. To many, the gray wolf symbolizes wildness and is valued intrinsically for reinhabiting parts of their former range. Others value the role the wolf plays in the larger ecosystem. For many farmers and ranchers, however, the wolf is a potential threat to their livestock and livelihood. Also, many people fear wolves and view them as a personal threat. For Native Americans, the wolf plays an important positive role and many traditional views of the wolf continue today. The gray wolf attained a cultural significance to many Native American tribes in Montana. For the Blackfeet, the wolf is a powerful religious symbol and is known as a "medicine animal" (Vest 1988).

Values can also be described in terms of attitudes toward wildlife and wildlife management. Respondents to the 1999 winter and summer YNP visitor surveys were asked to state their level of agreement or disagreement with a number of statements pertaining to wildlife and the environment. Table 17 shows how Montana residents responded during the two visitor surveys. Responses are remarkably stable between winter and summer YNP visits and both sample groups indicate a very high level of environmental interest and concern.

What drives the differences in attitudes towards wolves might be summed up as the perceived chance of personal benefit or loss resulting from the presence of wolves. Those who feel they will benefit either directly or vicariously tend to favor wolf restoration, and those who perceive the threat of personal loss oppose restoration. A survey in Flathead County in northwestern Montana indicated that most respondents were supportive of wolves naturally recolonizing the area, but that support could decrease if recreational and commercial land uses were restricted to promote wolf recovery (Tucker and Pletscher 1989). One survey in Wyoming found that most respondents who opposed wolf reintroduction would not change their responses even if a variety of their concerns were met, such as providing financial compensation for livestock losses due to wolves (Bath and Phillips 1990). This firmness of position indicates that some attitudes towards wolves have their basis not only in the tangible fear of financial losses but also, more deeply, in the history of the area and its people. Furthermore, attitudes towards wolves are rooted in society at least as much as they are based on wolf biology and will not be susceptible to campaigns intended to change them. Williams et al. (2002) advises that wildlife managers would do well to recognize that and maintain open dialogue with the general public and the affected interests.

One of the most detailed sources of data on Montana resident attitudes towards wolves specific to the wolf reintroduction effort is a survey of GYA residents conducted in 1993, including Montana counties contiguous to the park and several mostly rural counties in Idaho and Wyoming (Table 18). The responses show both general support for wolf presence in the park and specific concerns associated with potential problems related to livestock depredation and reduced big game hunting opportunities outside the park.

Table 17. Comparison of responses by Montana residents to statements concerning wildlife and wildlife habitat when asked during winter or summer visits to Yellowstone National Park. Source: Duffield et al. 2001.

Statements	Percent who agree		Percent who disagree	
	Winter	Summer	Winter	Summer
I have a great deal of concern for protecting wildlife habitat	95.1%	97.7%	1.2%	1.4%
Wildlife species must be beneficial to humans to deserve protection	20.7%	24.4%	68.0%	65.6%
It's important to protect rare plants and animals to maintain genetic diversity	83.5%	87.8%	5.9%	2.7%
I would be willing to contribute to protecting wildlife habitat even if I never see or enjoy the animals	67.6%	63.2%	10.8%	10.0%
Sample size	436	219	436	219

Table 18. Greater Yellowstone Area residents' attitudes toward issues surrounding wolf reintroduction. The "percent agreeing" includes the sum of responses for the categories "somewhat agree" and "strongly agree." "Percent disagreeing" was also aggregated. Because other response categories are not reported (e.g. "no opinion" and "not applicable"), data will not sum to 100%. Source: Duffield et al. 1993a.

Attitude Statement	Percent Agreeing	Percent Disagreeing
I would derive satisfaction from just knowing wolves are present in Yellowstone Park	46.5%	41.0%
I dislike even the idea of wolves being present in Yellowstone Park.	35.1%	57.4%
I might personally benefit from getting to hear or see wolves in Yellowstone Park.	47.5%	42.1%
I would like it if visitors to Yellowstone Park had the opportunity to hear or see wolves.	59.1%	31.2%
I would experience reduced hunting opportunities if wolves were reintroduced to YNP	21.3%	32.4%
I would be disappointed if hunters hunting on lands adjacent to YNP experienced reduced hunting opportunities due to the reintroduction of wolves into the park.	41.2%	36.2%
I would experience livestock losses due to wolf predation in my farming or ranching operation if wolves were reintroduced to Yellowstone Park.	23.4%	13.9%
I would be disappointed if ranchers outside the park experienced livestock losses due to the reintroduction of wolves into the park.	72.6%	13.7%

FWP Fiscal Environment

FWP derives a large portion of its annual operating budget from the sale of fishing and hunting licenses and matching federal dollars collected through excise taxes on the purchases of hunting and fishing related equipment. The choice of wolf conservation and management policies has the potential to affect FWP finances directly by how a wolf program is funded and indirectly through the interaction between wolves and their ungulate prey populations. For example, a substantial decrease in deer or elk numbers, by whatever cause or combination of causes, could lead to a lower level of hunter participation or lower license revenue. The decline may be exacerbated or prolonged in localized areas by the presence of a recovered wolf population. However, new license revenue may be generated by implementing a regulated harvest program for wolves as a management tool within the broader context of the overall program. Table 19 shows annual trends in Montana resident deer and elk license sales and prices. The number of deer licenses sold has declined slowly since 1980, while the number of elk licenses sold has remained relatively stable. Table 20 summarizes license revenue for the year 2000 from the sales of the major classes of deer and elk licenses and special permits.

Despite relatively consistent hunting regulations and hunting opportunity for antlered deer and elk, statewide resident elk and deer general license sales have declined since the mid-1990s. A survey of elk license holders, who purchased a license in 1996 and 1997 but not in 1998, was conducted to determine the reasons why these individuals did not purchase a license in 1998. The most frequently checked reason was *"other responsibilities a higher priority"* followed by *"access has become restrictive, low elk population, unsuccessful at special elk permit drawings, and unable to hunt with family or friends"* (FWP unpubl. data). Another factor influencing elk license sales is the aging of resident hunters. A study in

1988 showed that the average age of hunters was 38 years old. A similar study in 1998 revealed the average to be 46 years old (FWP 1988, 2001c). Therefore, license sales for resident hunters in the future will likely be influenced by factors well beyond the presence of a recovered wolf population.

By contrast, nonresident demand for Montana hunting licenses remains high, despite a considerably higher cost compared to residents. Nonresidents submit more applications than the nonresident allocation quotas for most categories of deer and elk licenses. About 85% of the total deer and elk license revenues come from nonresident license sales (Table 20).

Table 19. Trends in resident Montana deer and elk license sales and prices, 1980-2000. Source: Montana Fish, Wildlife and Parks license data.

Year	Adult Elk License		Adult Deer A License	
	Licenses Sold	Price	Licenses Sold	Price
2000	68,826	$16.00	88,233	$13.00
1999	72,281	$16.00	91,606	$13.00
1998	78,844	$16.00	92,569	$13.00
1997	77,252	$16.00	75,344	$13.00
1996	82,433	$16.00	107,689	$13.00
1995	87,244	$16.00	117,967	$13.00
1994	87,480	$16.00	121,903	$13.00
1993	86,917	$13.00	118,700	$13.00
1992	85,895	$13.00	121,918	$11.00
1991	82,680	$10.00	117,325	$11.00
1990	79,437	$10.00	114,106	$9.00
1989	78,604	$10.00	111,750	$9.00
1988	74,473	$10.00	111,515	$9.00
1987	59,674	$10.00	105,813	$9.00
1986	62,060	$10.00	108,196	$9.00
1985	63,862	$10.00	111,698	$9.00
1984	62,001	$10.00	122,309	$9.00
1983	64,376	$10.00	128,847	$9.00
1982	70,669	$9.00	131,051	$9.00
1981	87,070	$8.00	138,156	$8.00
1980	83,844	$8.00	131,723	$7.00

Human Safety

Along with other state and federal agencies as well as private organizations, FWP has recently taken a proactive approach to help people learn how to live and recreate in wildlife habitats. Increasing numbers of people are living within the urban-wildland interface where a potential for conflict with a wide variety of wildlife species exists. Outdoor recreation trends also show increasing numbers of people recreating in wildlife habitats where interactions could become more frequent (Youmans 1999). Living and recreating in wildlife habitats has inherent risks. Through policy development, public outreach, and technical assistance to landowners and recreationists, FWP is working towards mitigating those risks to the extent possible.

In accordance with Montana statutes, FWP and the FWP Commission are charged and authorized to protect people and personal property from damage and depredation caused by wildlife. FWP defines a public safety problem related to carnivores as: any situation where an FWP employee reasonably determines that the continued presence of a carnivore poses a threat to human safety, an attack has resulted in the loss of livestock or personal pets, or that a human has been physically injured or killed.

Table 20. Montana Fish, Wildlife & Parks 2000 revenue from major deer and elk license and permits. Source: FWP historical license sale records.

License or Permit Type	Number Sold	Price	Total FWP Revenue (dollars)
Resident - Elk Permit	39,945	$3.00	119,835
Resident - Elk License– Adult	68,826	$16.00	1,101,216
Resident - Elk License Senior or Disabled	16,704	$8.00	133,632
Resident - Deer A License - Adult	88,233	$13.00	1,147,029
Resident - Deer A License - Senior or Disabled	21,709	$6.50	141,109
Resident - Deer B Permit	40,592	$8.00	324,736
Resident Total Fees			2,967,557
Nonresident- Drawing Fee	196,759	$3.00	590,277
Nonresident - Big Game Combo -General	10,715	$475.00	5,089,625
Nonresident - Big Game Combo – Outfitter	5,606	$975.00	5,465,850
Nonresident - Deer Combo - General	2,300	$245.00	563,500
Nonresident - Deer Combo - Outfitter	2,304	$850.00	1,958,400
Nonresident - Deer Combo - Landowner	2,000	$250.00	500,000
Nonresident - Elk Combo - General	785	$425.00	333,625
Nonresident - Elk Combo - Outfitter	623	$875.00	545,125
Nonresident Total Fees			15,046,402
Total of Resident and Nonresident Fee Revenue			18,013,959

Wolf-human Encounters

Public safety is an important consideration because species such as the gray wolf, mountain lion, black or grizzly bears are capable of injuring or potentially killing a person. Though wolves generally fear humans, there are cases where individual wolves lost their fear of people and caused injuries, but no fatalities have reported in North America (Mech 1998a, Route 1999). McNay (2002) provides a comprehensive review of case histories of 80 incidents of wolf-human interactions in Alaska and Canada, spanning from 1900 through 2001. It appears most wolf-human encounters were not precipitated by the wolf perceiving the human as prey because of how the wolves behaved, the presence of domestic dogs, or the duration and type of interactions between wolves and humans leading up to the incident (Mech 1998a, McNay 2002a, Carnes and Van Ballenberghe unpubl.). Instead, wolves losing a sense of fear of humans seems to be a common thread running through most North American wolf incidents resulting in human injury (Mech 1998a, McNay 2002b). Of the 80 cases reviewed by McNay (2002b), 39 included elements of aggressive behavior by healthy wolves, 29 were not aggressive, and 12 cases involved known or suspected rapid wolves. Of the 16 cases in which healthy wild wolves bit people or their clothing, 10 of

16 resulted in minor injuries while six were considered severe. This is in stark contrast to the case histories of mountain lion-human incidents in which mountain lions sometimes appear to perceive humans as prey (Deurbrouck and Miller 2001). Case studies of injurious bear-human incidents highlight surprise encounters, defense of cubs or food, and/or the bear perceiving the human as a threat to be neutralized (Herrero 1985).

It appears that wolves can habituate to humans or human activities as readily as bears or mountain lions (Aune 1991, McNay 2002b). Habituation in wolves may not require a consistent pattern of food conditioning, as is often the case for bears. Wolves may increasingly tolerate or even seek out close proximity with people through repeated social interaction with people and where they are "rewarded" in some fashion, whether by acquiring food or novelty items such as shoes. While some time may be required for a wolf to habituate to human proximity, some case histories suggest that it can occur within days of the first encounter (McNay 2002b). Other important variables are whether or not there are food rewards, the frequency of interaction, the individual character of each wolf, the presence of domestic dogs, and whether the wolf is infected with rabies. McNay (2002a) cautioned that the transition from non-aggressive behavior to aggressive behavior in habituated wolves could be rapid and unpredictable. Whether or not habituation escalates to an immediate threat to human safety may hinge on a prompt management response by the appropriate authorities.

Surprise encounters between wolves and humans may also occur (McNay 2002b). In Montana, hikers have unknowingly encountered an occupied den site and wolves responded by barking. Other encounters occurred away from wolf den sites and ended when the wolf retreated, without injury to human or pet. Reported wolf behavior in these cases was consistent with other case histories reviewed by McNay (2002b). Since the mid-1980s, the only two injuries to humans by wolves in Montana occurred when wolf researchers and managers handled unrestrained animals during capture operations. However, there have been eight mountain lion-human incidents in Montana from 1990-1999 in which seven people were injured and a young boy was killed (FWP unpubl. data). In all of these encounters, the human was not aware of the lion.

Wolves have injured and killed domestic pets, primarily dogs and llamas in Montana. Most incidents involved guarding or livestock herding dogs, although in some instances, the dog was killed in close proximity to a structure or outbuilding. Other cases of dog depredations were of hunting hounds trailing mountain lion or bobcat scent. Hounds do not typically switch scent trails from felids to canids, but may encounter wolves while pursuing wild cats or at lion kills assumed by wolves. Bangs and Shivik (2001) also noted that wolves probably perceived hunting hounds and guarding/herding dogs as "trespassing" competitors rather than as prey.

A recent review of wolf attacks on dogs in Finland suggested that wolves could attack domestic dogs either within the context of territorial defense or food acquisition (Kojola and Kuittinen 2002). Territorial defense was most plausible in forested settings and often involved more than one wolf. In most instances, wolves ate the dog upon its death. There are no methods to prevent wolf predation on domestic dogs in hunting situations in which its owner does not directly supervise the dog. Food acquisition was more consistent with single wolves attacking dogs in rural house yards. Preliminary evidence indicated that risk of wolf attacks on dogs might be associated with density of natural prey and the predation efficiency of individual wolves or packs.

Despite their general wariness of people, wolves will use natural habitats in close proximity to humans and may sometimes approach very close to buildings or structures. This is particularly true in northwestern Montana where people build their homes in thick, forested habitats. Members of the Murphy Lake pack are occasionally seen within 100 yards of homes and in rare instances closer. While this pack is clearly accustomed to human activity within its home range, its members have shared the

landscape with people for about 10 years without a human-wolf incident. As wolves disperse from established packs occupy more habitat in Montana, they will be seen more and more frequently. Some of those observations will be close to human development, particularly if wild prey species are in the area.

Because wolves live in social groups, people may see them more frequently than other large carnivores, although wolves are not necessarily any more dangerous. Mountain lions and bears are solitary, except for mothers with dependent young or during the breeding season. Wolves are much less secretive than mountain lions. Wolves may feed and rest in open areas with good visibility, whereas lions tend to hide their kills and feed or rest in dense vegetative cover. Wolves will also readily travel across openings in forest cover or natural meadows in ways that mountain lions or bears do not. In addition, wolves use linear corridors such as roads, utility lines or railroad rights-of-way for traveling and scent marking. Because of the differences between the secretive stalking behavior of mountain lions and the broad, open searching behavior of wolves, people probably have a greater, yet still remote, chance of an unexpected close encounter with a mountain lion than with a wolf.

The natural order of existence for wolves in the wild is to belong to a pack. With pack membership come "duties", such as establishment and maintenance of social hierarchies, patrolling and marking territory boundaries, hunting, feeding and tending pups, resting, and interacting with other wolves or wildlife species. Wolves affiliated with a pack are usually actively engaged in a "purpose" and do not spend extended periods of time loitering in any one location, particularly near humans. One exception is extended presence and activity at den or rendezvous sites. When pack-affiliated wolves are seen alone, it is usually sporadic travel for a particular reason. Even dispersing wolves generally do not loiter and move through areas near people. In contrast, a single wolf seen repeatedly loitering in an area near people and does not appear to be affiliated with a pack can become habituated, food conditioned, depredate livestock or domestic pets, or otherwise interact with people at decreasingly safe distances. If this pattern is allowed to continue, the wolf may become a safety concern. This will become especially evident if the animal does not respond to hazing or harassment and repeatedly returns to an area.

Wolf Monitoring

Presently, USFWS and its cooperative partners conduct all wolf monitoring. University students and faculty, individual citizens, private organizations, or other state and federal agency personnel collect additional information about wolves. While the focus of the current USFWS monitoring program is the documentation of breeding pairs that meet the recovery definition criteria, additional knowledge is gained in the process. Generally, most prey population monitoring is conducted by FWP, although cooperative efforts involve universities and other agencies.

Using telemetry as the primary monitoring tool, USFWS documents overall wolf population status and trend by recording reproduction and known mortalities. USFWS also generates information about wolf pack size and distribution, individual territory boundaries, how packs move through and use their territories, locations of wolf dens and rendezvous sites, and interactions between packs. USFWS documents known wolf dispersal events between and among the three federal recovery areas and Canada. USFWS has also been investigating non-telemetry based monitoring protocols, such as track surveys, to assess the validity of less stringent definitions of "breeding pair" than the recovery definition. Special management needs, opportunities, and constraints have also been identified.

USFWS collects information through observational reports of wolves and wolf sign (tracks, scat) submitted by citizens and resource management agency personnel. Repeated observations of animals and/or sign in an area often leads to the discovery of new packs and confirms pack persistence through time. USFWS also collects information through track counts, howling surveys to confirm

presence/absence, and data profiling of genetic material. Anecdotal information supplements formal monitoring protocols, including depredation investigations by WS that document wolf activity in a new area or the number of wolves in a pack.

For the first five years after the gray wolf is delisted, FWP will be required to document that the wolf population is secure within Montana. Periodic review of these data by FWP and similar agencies in Idaho, Wyoming, and other cooperators, will be necessary to ensure that the tri-state population remains above the northern Rockies recovery levels. FWP recognizes that beyond its legal requirement for population monitoring, FWP will improve management of wolves and native prey by collecting scientifically credible information. Radio collars deployed by USFWS may still be functioning when the state assumes management authority. FWP expects to have some reliance on telemetry-based monitoring protocols initially, but like USFWS, FWP could also investigate other, less expensive protocols or definitions of what constitutes a pack. For instance, unpublished USFWS data indicate that there is a strong correlation between the number of breeding pairs meeting the federal recovery definition and the number of "social groups" of wolves, if social group is defined to mean four or more wolves traveling in winter. The monitoring intensity and expense required to monitor social groups would likely be less than the intensity of monitoring the number of breeding pairs, yet the reliability and accuracy of the data may be adequate. USFWS and FWP are currently exploring these relationships.

Private Property

FWP has authority to manage wildlife over approximately 88.3 million acres, or roughly 93% of the state (excludes national parks and reservations). Approximately 58.4 million acres of the total is privately owned, hosting a significant wildlife resource which, itself, is "publicly" owned. Much of that land is used for agricultural purposes (crops or livestock grazing). The earliest European settlers brought farming traditions and livestock with them. Montanans have been raising livestock for more than four generations. Agricultural heritage is woven through Montana's cultural fabric, just like the heritage of wildlife conservation. The rural characteristics of one affirm the other.

Farming and ranching maintains open space that is also habitat for a diversity of wildlife species, including wolves. Maintaining the land base for agriculture and wildlife habitat is an increasing challenge, given broader trends in resource and agricultural economics, human population demographics, and development of the "New West" (Riebsame 1997). There are secondary benefits to a vigorous agricultural industry, including sustained economic activity in small rural communities, decreased rates of land conversion for subdivision and development, and maintenance of rural lifestyles.

Most Montana landowners are interested in, proud of, and enjoy the wildlife associated with their properties, even while acknowledging the challenges posed by wildlife and the occasional conflicts. Some landowners are deferential to wildlife and have a high degree of tolerance for conflict, even promoting wildlife habitat and wildlife use of their lands. In some cases, wolves in particular are welcomed. But history has demonstrated that wolf presence can create problems for landowners trying to raise livestock. Financial losses may result directly from wolf depredation. Indirect costs may accumulate because of increased management activities or changes to agricultural operations. These financial hardships accrue to individual farmers and ranchers and may be significant to them. What makes wolf-livestock conflicts unique from other wildlife-livestock conflicts are the changes in the legal status of wolves through time. Historically, farmers and ranchers had the latitude to take care of problem wolves themselves. Since 1973, wolves have been legally protected by ESA and state law. Livestock owners have had limited flexibility to protect their private property.

Regardless of historical events and how present circumstances evolved, tolerance for wolves on private property has been fundamental to the overall success of the federal wolf recovery program. This is highlighted by Montana's patchwork of public and private lands and how wolves have distributed themselves. During the state's scoping process for this EIS, wolf presence on private property and how wolf-livestock conflicts would be resolved (in the context of livestock being private property) were also raised.

Hybrids

Hybrids result from the breeding of *Canis lupus* with domestic dogs (*C. familiaris*), resulting in variable combinations of physical traits and behaviors. Much of the normal predatory behaviors of wild wolves disappeared in domestic dogs. But the predatory instincts are still present to an unknown and unpredictable degree in wolf-dog hybrids. Although hybrids commonly lack a fear of humans, the animals are generally poorly adapted as domestic pets because their behavior is unpredictable and their response to general obedience training is poor. While the keeping of captive wolves and hybrids as pets is rewarding to some individuals, others find it unmanageable and try to find new homes for their pets. Hybrids have been released into the wild and others apparently escaped from their owners. The potential for genetic pollution of wild populations, human safety issues, and erosion of public acceptance for wild wolves are commonly cited problems with private ownership of captives or hybrids and release of these animals in the wild.

Methods to distinguish non-native wolf-like canids from native wild wolves in the northern Rockies include a combination of genetic analyses, morphology, and behavior (Boyd et al. 2001). At present, there is no genetic or other evidence that captive wolves, wolf-dog hybrids, domestic dogs, and coyotes interbred with native Rocky Mountain wolves in the wild (Boyd et al. 2001). Wolves and coyotes can be easily differentiated genetically. However, current genetic tests cannot distinguish between wild wolves, domestic dogs, and wolf-dog hybrids. Because domestic dogs evolved from wild wolves, they have similar genetic characteristics. It is unlikely, however, that a released captive or wolf-dog hybrid would survive long enough to reproduce with wild wolves (Bangs et al.1998). The concern about genetic pollution in the northern Rockies population is overstated.

There are behavioral differences between wild wolves, wolf-dog hybrids, and captive wolves. These differences provide important clues to managers in situations where the origin of the animal is not known. Released captives and hybrids will typically associate with humans and loiter near human settlements for periods of time that are much longer than expected compared to a wild wolf traveling through an area. They may even be more likely to depredate domestic animals than wild wolves (Bangs et al. 1998). In the tri-state area, wolf-dog hybrids have been found in the wild sporadically since at least 1986 (Bangs et al. 1998). Two cases in 1997 were south of YNP. In each case the animal loitered on private property, scavenged, and one killed domestic sheep. Both animals were euthanized. Two cases that were reported in northwestern Montana in 2002 had similar case histories (Meier pers. comm.).

Across the U.S., wolf-dog hybrids have been responsible for human attacks, maulings, dismemberments, and deaths. Many incidents involved children. The animal's large size, lack of fear, and unpredictable behavior make it especially problematic. As of 1997, the Food and Drug Administration had not approved rabies or other vaccines for use with captive wolves or hybrids. Despite lack of approved vaccines, many captive wolf or hybrid owners use the standard dog rabies vaccine. Nonetheless, there is still concern for public safety.

It is legal to possess captive wolves and wolf-dog hybrids in Montana. Citizens may keep them as personal, private pets without a permit. Citizens wishing to publicly display captives or wolf-dog hybrids

or to attract trade must have a permit from FWP. Montana statutes (87-1-231) and administrative rules require the permanent tattooing of any wolf held in captivity, where "wolf" means a member of the species *Canis lupus*, including any canine hybrid, which is ≥ 50% wolf. Owners are also responsible for compensation and damages to personal property caused by any wolf that is held in captivity or that escapes from captivity.

Cultural, Archaeological, and Historical Resources

Evidence of about 12,000 years of human occupation of the Montana landscape is divided into prehistoric archaeological sites (such as stone circles, lithic scatters, or bison kill sites) and historical sites (such as homesteads or railroad depots). Although documentation suggests preferred areas of use and occupation, no environmental/topographic zone can be ignored as having potential for containing cultural resources. The value of cultural resources lies in its potential to provide information about societies past. The gray wolf attained a cultural significance to many Native American tribes. The wolf recovery areas contain lands that the tribes used traditionally and continue to do so today.

FWP's Parks Division is responsible for preserving and managing important historical and cultural resources that are incorporated within the state parks system. Examples are Ulm Pishkun, Bannock, Chief Plenty Coups, and Traveller's Rest.

Physical Environment

Air

Air provides for the exchange of gases basic to life, whether plant or animal.

Soil

Soil is a basic natural resource essential for plant growth and animal survival. Rich, healthy soil supplies nutrients for vegetation upon which wildlife depend for food and cover. Montana has a diverse landscape of soils, varying with geological parent material, climate, vegetation, rates of weathering, and human manipulation such as logging, mining, and agriculture. Human manipulation affects soils through compaction, erosion, and changes in chemical composition including accumulation of toxic chemicals.

Aquatics / Water Quality / Fisheries

Montana is dissected by 178,896 miles of streams and contains more than 10,000 lakes, reservoirs, and ponds for a total of 979,433 acres of water surface. Groundwater is important for agriculture, commercial industries, municipal and rural residential purposes. Surface water is valuable for wildlife and recreation. Wetlands are areas where water saturation is the dominant factor influencing soil, plants, and animal communities (Cowardin et al. 1979). Wetlands are important riparian ecosystems in the regulation and maintenance of rivers, lakes and groundwater systems. They also maintain water quality and improve degraded water by assimilating nutrients, reducing sediment load, and processing some chemical and organic waste. Wetlands and riparian areas are the most biologically productive ecosystems, and are particularly critical to maintain a diversity of wildlife. Waterfowl, wading birds, and shore birds use wetlands for feeding, nesting, migration, and wintering.

Over 11,000 individual waters support 90 species of fish. Of these, 56 are native to Montana, two others are possible natives, and the rest were introduced. Thirty-one species are classified as game fish under Montana statutes. Eighteen species are listed as "species of special concern", two are listed as federally endangered, and one is federally threatened. Several other species are candidate species for listing under ESA. Fishing is a popular pastime. About 34% of all residents purchase fishing licenses annually.

CHAPTER 3: ALTERNATIVES

This chapter describes five alternatives and outlines how each alternative addresses issues identified by the public. FWP's preferred alternative is also described. A summary is included at the end of the chapter (Table 30).

Introduction

FWP initiated this EIS to involve all Montanans in the wolf planning process and to ensure full compliance with MEPA. Because of the significant number of comments taken during the scoping period, FWP consulted with the Wolf Management Advisory Council prior to finalizing the alternatives presented in this EIS. In January 2003, FWP and the council discussed and examined new information and a summary of public comments. The council discussed several new issues that arose during the scoping process, revisited some issues it had previously discussed, and formally endorsed several updates to their original planning document. The updates are incorporated into this document.

Ultimately, FWP crafted a total of five alternatives. One alternative suggests that FWP would not develop and adopt a state wolf management program. Three alternatives, presenting a spectrum of approaches, suggest that FWP should adopt a management program. One of these three is the work of the council. The fifth alternative presents a "contingency," or interim plan that FWP would consider implementing if delisting were delayed. Table 21 summarizes the main scoping issues and indicates which issues were significant enough to drive creation of the alternatives and which issues were treated differently in each alternative.

Table 21. Issues identified by the public (in the order of their frequency), whether or not the issue drove creation of a separate alternative, and whether the issue is treated differently in each alternative.

Scoping Issues	Drives Creation of Alternatives?	Treated Differently in the Alternatives?
Wolf Management, Numbers, and Distribution	Yes	Yes
Social Factors	Yes	Yes
Administration and Delisting	Yes	Yes
Prey Populations	Yes	Yes
Funding	Yes	Yes
Livestock	Yes, with Compensation	Yes
Wolf Habitat, Connectivity, Land Management	No	Yes
Compensation	Yes, with Livestock	Yes
Economics / Livelihoods	No; overlaps other issues	Yes
Information/Education, Public Outreach	No	Yes
Human Safety	No	No
Monitoring	No	Yes
Other Wildlife	No	No
Private Property	No	Yes
Hybrids	No	No
Wildlife Management Areas	No	Yes
Questions	No	Yes

Alternatives Selected for Analysis

In general terms, most public scoping comments fell along a continuum from highly protectionist philosophies to highly exploitive philosophies. More specifically, input ranged from the need to prevent all wolf mortalities (no matter what the circumstances) to the need to kill or remove all wolves from Montana. This philosophical spectrum represents peoples' values, opinions, and beliefs. These represent the social factors that need to be considered. Four alternatives were crafted to represent that philosophical continuum within the sideboards of the federal requirement for a secure population. The fifth alternative falls within the continuum, but describes a potential interim state program under a different legal context than the other alternatives—namely state management while the gray wolf is in the process of being delisted.

The issues establish the framework for the development of the alternatives and guide their development. The alternatives could be thought of as the different ways of accomplishing the proposed action and they encompass a range of possibilities so that there are clear differences between the alternatives. FWP selected one of the alternatives as its preferred approach, but FWP is not legally required to make that alternative its final decision. In fact, FWP could select any of the alternatives or even combine elements of several alternatives into a new alternative based on the public comment it receives on this draft and the results of the environmental review. The public is welcome to comment on specific elements within an alternative. As described previously, the ROD and the final EIS will describe FWP's decision and the wolf conservation and management program in detail.

The main issues selected for further analysis and which underlie the specific details of the alternatives are: wolf conservation and management, social factors, administration, prey populations, livestock, and compensation. These issues will remain the primary focus for the analysis of environmental consequences (Chapter 4). Because a continuum was also evident for the other issues listed in Table 21, many are also treated differently in each of the alternatives. The five alternatives listed below are described in greater detail in this chapter and summarized in a table at the end of the chapter (Table 30).

1. No Action. FWP does not develop and adopt a wolf conservation and management program.

2. Updated Council. FWP would adopt the Montana's Wolf Management Advisory Council's Planning Document as written and updated by the council in January 2003. Montana's wolf conservation and management program would consist of the original planning document and the updates outlined in this EIS. This is FWP's preferred alternative.

3. Additional Wolf. FWP would adopt the council's updated Planning Document as the conservation and management program, but the number of breeding pairs would be increased. This alternative was developed in response to public comments expressing general support for FWP to manage the gray wolf, but to do so conservatively and with greater numbers of wolves on the landscape.

4. Minimum Wolf. FWP would develop and adopt a wolf conservation and management program that meets the minimum standards and requirements for a secure, viable wolf population, but requires aggressive management to maintain wolf population numbers at the lowest level acceptable to USFWS and restricts wolf distribution to primarily public lands in western Montana.

5. Contingency. FWP would seek to implement most provisions of Alternative 2 through an agreement with USFWS while the gray wolf was still listed under ESA, in the event that actual

delisting is postponed because of delays in state planning efforts or because prolonged litigation blocked transfer of full authority to Montana. This alternative represents an interim step. FWP would be working to accomplish delisting with USFWS, but FWP would begin managing the Montana gray wolf population while the delisting process is completed. Once delisted, FWP would implement the remaining elements of Alternative 2 (Updated Council) that had previously been prohibited by federal regulations.

Alternatives Identified during Scoping, but not Considered Further

1. *No gray wolf recovery program in the northern Rockies or individual wolves present in Montana.*

This alternative was not considered because it is outside the sideboards established by the Northern Rocky Mountain Wolf Recovery Plan, which calls for a viable, secure wolf population in the states of Montana, Idaho, and Wyoming. The question of whether or not wolves will be present in Montana has been addressed through various legal challenges to the federal recovery program. All litigation has been resolved and wolves will remain. Although there have been previous reports of gray wolves in Montana, wolves began dispersing into northwestern Montana from Canada in the early 1980s and were reintroduced to YNP and central Idaho in the mid 1990s. Removing all wolves from Montana is neither feasible nor legal. Relevant alternatives for this EIS must address the question of *how* gray wolves in Montana will be managed in the future.

2. *Delist the gray wolf from ESA, but USFWS retains management responsibility.*

The U.S. Congress charges USFWS with the recovery of listed species, and ESA directs USFWS to delist species once recovery criteria are met. There is no legal mechanism or precedent for USFWS to manage a delisted species. Indeed, the opposite is true. The respective state fish and wildlife agencies are the traditional and appropriate entity to manage non-imperiled species--as resident, native wildlife according to state laws and regulations. For USFWS to continue managing the gray wolf in Montana, the species would need to remain listed under ESA, even after recovery criteria are met. This would conflict with USFWS's authority and the legal requirements of ESA to delist species once recovery goals are met.

3. *Changes in how USFWS implements the recovery program in Montana. A related alternative could involve changes to ESA.*

The states, through their respective fish and wildlife agencies, are encouraged to conserve and manage species so that federal ESA protections are not warranted. However, once a species is listed under ESA, the U.S. Congress invests almost sole authority to oversee recovery efforts with USFWS and their cooperating partners due to the national value associated with recovering rare and imperiled species. In 1995, FWP decided that it would not formally participate as a cooperator in shaping and implementing the recovery program. However, FWP has participated informally through consultation and information exchange since then. FWP continues to informally consult with USFWS, but does not have any decision-making authority in the federal program currently. Modification of ESA is a separate issue and well beyond the scope of the proposed action.

Description of the Alternatives Considered

Alternative 1. No Action

Under this alternative, Montana does not prepare or adopt a state conservation and management plan. Because the state would not develop a plan, USFWS would not propose to delist the gray wolf.

Therefore, wolves in Montana would continue to be managed by USFWS. This alternative represents the existing situation.

Implementation of this Alterative

Implementation of this alternative would involve FWP completing this EIS process and signing a Record of Decision indicating that it will not take any further action.

How Does this Alternative Address the Major Issues?

Wolf Management, Numbers and Distribution. USFWS and its cooperating partners carry out all management, monitoring, public outreach, and technical assistance to landowners. Wolves occurring within the Northwestern Montana Recovery Area are currently managed as "endangered" while wolves occurring elsewhere in Montana are managed as "experimental, non-essential" according to the final rules adopted for the reintroduction effort (USFWS 1994a).

USFWS decision-making is guided by ESA, the Northern Rockies Wolf Recovery Plan (USFWS 1987) and its amendments, the Northwestern Montana and Central Idaho Interim Wolf Control Plan (USFWS 1999), the Final EIS on Reintroductions of Gray Wolves to YNP and Central Idaho, and the experimental rules (USFWS 1994a). The USFWS could adopt or amend management policies or regulations at any time in the future, so long as the changes were consistent with ESA requirements to recover the species and the proper procedural steps are followed. In 2000, USFWS proposed to reclassify wolves in northwestern Montana from "endangered" to "threatened" and to implement new rules that increase management flexibility for the agencies and landowners (USFWS 2000). USFWS has not announced a final decision on that proposal.

Wolf management on behalf of other interests is somewhat limited under the existing federal recovery program. The primary focus of the federal program is on recovery of the species—increase wolf numbers and distribution so that protection under ESA is not longer warranted. USFWS may or may not be able to address certain issues, depending on the legality or consistency with existing federal regulations. The federal program emphasizes conflict resolution for livestock and human safety concerns rather than proactive management of wolf abundance or distribution per se. USFWS has limited management flexibility under ESA.

Social Factors. This alternative represents the most conservative because federal law and regulations, most notably ESA, guide the program not state laws. This alternative was created to most closely reflect public comments that expressed protectionist philosophies, a distrust of state wildlife agencies, and that supported permanent protection of the gray wolf under ESA. Ironically, this alternative also reflects some public comments that did not support the State of Montana developing a program because wolf management would then stay with USFWS, the agency "responsible for creating a problem for Montana residents."

Administration, Delisting. USFWS would not propose to delist the gray wolf in the northern Rockies in the absence of conservation and management plans from Montana, Idaho and Wyoming. Therefore, the species remains listed and managed by USFWS and the cooperating partners in all aspects. The State of Montana would not be involved in day to day management activities.

Under the Montana Endangered Species Protection Act, the gray wolf would still remain listed as "endangered" throughout Montana because SB163 would not take effect. FWP will still have some obligations under the state law to assist the federal recovery effort under Montana's Section 6 agreement

to conserve threatened and endangered species. The State of Montana will still informally consult with USFWS, but the state would not participate in decision-making.

Prey Populations. USFWS would not carry out any particular management on behalf of prey populations, but the agency acknowledges that wolf predation can influence prey population abundance or distribution, particularly in conjunction with other environmental factors or concurrent with human hunting. FWP would continue managing ungulates subject to existing plans and policies. In 2000, USFWS proposed new regulations to allow a state or tribe to capture and translocate wolves to other areas because of adverse impacts to wild ungulate populations after preparation of a state wolf management plan. State plans must define impacts, describe how they will be measured, and identify possible mitigation measures. Before any management activities occur, USFWS has to approve the plan and conclude that such translocations would not slow wolf population growth. Presently, a Montana wolf management plan has not been adopted or submitted to USFWS for approval. Under this alternative, none would be prepared in the foreseeable future, so capture and translocation of wolves to other areas because of impacts to ungulate populations could not occur.

Funding. USFWS wolf recovery program in the northern Rockies is funded through the U.S. Congressional budgeting and appropriations process. FWP occasionally consults informally with USFWS as needed. The current FWP budget will cover the administrative costs of ongoing informal coordination (up to $5,000).

Livestock / Compensation. USFWS and WS respond to and resolve wolf-livestock complaints according to existing federal regulations. Pending rule changes could provide more flexibility for federal officials to resolve conflicts in northwestern Montana (Bangs pers comm.). Federal officials attempt to resolve conflicts as quickly and efficiently as possible by focusing on the offending individual/s. Management tools include technical assistance to reduce the conflict potential, telemetry-based monitoring, non-lethal hazing devices (or munitions by permit), relocation, and lethal control.

For as long as the gray wolf is listed, livestock producers are also constrained by federal regulations, so they need to be cautious because different rules apply in the three federal recovery areas overlapping Montana's state borders (Figure 1). In the Northwestern Montana Recovery Area, wolves are presently classified as "endangered" which prevents landowners from legally hazing, injuring, or killing wolves caught wounding or killing their livestock whether or not the incident takes place on public or private land. The only recourse is to report the incident to USFWS or WS as soon as possible. Elsewhere in Montana, landowners are able to harass wolves in an opportunistic, non-injurious manner on leases or private property, but producers must report it to USFWS within seven days. Also, a landowner could lawfully injure or kill a wolf caught injuring or killing livestock on private property, but the incident must be reported within 24 hours. In some circumstances, USFWS issues special permits to individual landowners or their agents to kill a wolf, in lieu of a USFWS or WS control action when agency control actions have been ineffective. These permits have strict provisions and conditions under which they could be issued to and exercised by a landowner. Until adoption of new rules, the differences in options available to Montana livestock producers remain in effect.

Defenders of Wildlife recognized that a compensation program could help shift the economic liability of wolf restoration away from livestock producers who may be directly affected by wolf-caused losses. Established in 1987, the fund is administered and financed independently from USFWS or WS activities. Upon receiving the report of a WS field investigation, a Defenders of Wildlife representative negotiates directly with the livestock owner to determine compensation. Through the Bailey Wildlife Foundation Proactive Carnivore Conservation Fund, Defenders of Wildlife also cost-shares proactive, preventative management activities, such as installing electric fencing, building a night pen, or increasing the number of guarding animals. The compensation program is intended to assist in the recovery efforts of listed

species. Defenders of Wildlife will presumably continue providing compensation payments and cost-sharing preventative management tools so long as the gray wolf remains listed. However, these efforts are voluntary and sustained by private donations.

Wolf Habitat, Connectivity, and Land Management. The gray wolf is a habitat generalist and can survive where there is adequate prey and legal protection from indiscriminant killing by humans. The federal program emphasizes public lands where the potential for conflict is lower, but USFWS acknowledges that wolves can and do use private lands. Connectivity of wolf packs is assured by the legal protections of ESA, a relatively high reproductive rate, and dispersal between and among the three recovery areas. Designating critical habitat or specific corridors was not necessary for wolf recovery in the northern Rockies. Outside national parks, there are few travel restrictions or area closures on public lands specifically for wolves. YNP and GNP both enacted temporary area closures around den sites vulnerable to excessive disturbance by humans.

Economics / Livelihoods. USFWS recovery program has avoided disrupting land management activities such as logging that may be harmful to local economies and people's livelihoods. USFWS has also tried to address wolf-livestock conflicts rapidly and efficiently in recognition of the disproportionate effect wolves may have on some operators. Changes in big game hunting activity and resultant economic effects on outfitters are primarily a state issue because FWP manages ungulate populations and a state board oversees the outfitting industry. USFWS recognizes that wolf recovery in the northern Rockies benefits other economic sectors and commercial activity because of the increased tourism and visitation associated with wolf viewing.

Information / Public Outreach. USFWS and their cooperating partners prepare an annual report for the Northern Rockies Recovery Program. Weekly updates are widely distributed electronically and posted on the USFWS web site throughout the year. Technical assistance is provided to landowners and others. Presentations are made to civic groups and in educational settings. In addition, private entities and non-profit organizations help fulfill public educational needs.

Human Safety. A person can legally injure or kill a wolf in response to an immediate threat to human life. The action must be reported to USFWS within 24 hours. Currently, citizens cannot injure or kill a wolf to defend a pet in Montana, but that could change depending on whether USFWS adopts a proposed revision to the rules (USFWS 2000).

Monitoring. The goal of the federal monitoring program is to measure progress towards recovery, such as documenting breeding pairs and counting pups, confirming pack persistence or new pack formation, delineating pack territories, etc. Radio telemetry is an important, but expensive monitoring tool. Other information is gathered from public reports of tracks, sightings, or sign. WS field activities also yield important information and contribute to the monitoring program. How intensively USFWS would continue to monitor a recovered, but still listed wolf population in the Northern Rockies is unclear. Any effort beyond documenting that the minimum recovery goal is met could be subject to USFWS budget priorities.

Other Wildlife. Wolves are an important link in the food chain and probably are important for ecosystem functioning. No special management provisions exist for other wildlife species per se. Prior to implementing any recovery program, USFWS completes an internal review to assess the impacts of recovery on any other ESA-listed species. FWP could address any special needs of non-listed species if it becomes necessary.

Private Property. Although the federal program concentrated recovery efforts on public lands, the gray wolf is a wide-ranging carnivore capable of long distance movements. USFWS acknowledges that

wolves will use private property. In addition, USFWS acknowledges that wolves can injure or kill livestock, a type of private property damage. Aspects of the program address that damage (see *Livestock / Compensation* issue above). Private property uses are not restricted.

Hybrids. Gray wolf-dog hybrids or captive wolves do not contribute to the federal recovery program in the northern Rockies and are not protected by ESA. In response to reports of large canids near people, USFWS establishes whether or not the animal is a wild wolf. If it is not a wild wolf, USFWS defers to local or state authorities to resolve the problem. State law assigns regulatory oversight of hybrid or captive wolf ownership to FWP. Federal and state laws prohibit removing wolf pups from the wild.

Wildlife Management Areas. There are no special provisions in the federal program governing wolf occupancy or use of FWP WMAs. WS would investigate wolf-livestock conflicts on WMAs similar to investigations elsewhere.

Alternative 2. Updated Council – *FWP's Preferred Alternative*

Under this alternative, FWP adopts and implements the Montana Wolf Management Advisory Council's Wolf Conservation and Management Planning Document and the updates to the document described in this EIS. This document suggests that FWP recognize and accept the challenges, responsibilities, and benefits of a restored wolf population. It also acknowledges that wolf management will not be easy, but that wolf restoration is fundamentally consistent with Montana's history of wildlife restoration and conservation. The planning document also describes a spectrum of management activities that maintain viable populations of wolves and their prey, resolve wolf-livestock conflicts, and assure human safety. The management philosophies and tools are intended to assure the long-term persistence of wolves in Montana by carefully balancing the complex biological, social, economic, and political aspects of wolf management. The Planning Document is presented in its entirety as Appendix 1. How the planning document and subsequent council updates address each of the scoping issues are summarized below.

Upon federal delisting, provisions of SB163 take effect and wolves would automatically be reclassified under state law from "endangered" to a "species in need of management." This statutory classification confers full legal protection under state law.

Implementation of this Alternative

Implementation of this alternative is contingent on securing adequate funding for each of the program elements. Implementation also requires FWP to develop and adopt final administrative rules and regulations under the "species in need of management" designation. This alternative represents FWP's proposed management direction, rules, and regulations. The FWP Commission may then approve and adopt the administrative rules and regulations, including any special language pertaining to wolf management or how FWP would interpret relevant state laws. This alternative would form the basis of those administrative rules and regulations. Future FWP Commission action could reclassify the gray wolf as a big game animal or a furbearer when it becomes appropriate to do so. The FWP Commission would concurrently establish regulations pertaining to management and regulated harvest under the new species designation. The Montana Legislature would establish a wolf license for regulated public harvest, the license fee, penalties for illegal take, and the restitution value. MOUs must also be finalized with MDOL and WS. FWP may seek to develop MOU's or cooperative agreements with Indian tribes to coordinate management and clarify roles and responsibilities.

How Does this Alternative Address the Major Issues?

Wolf Management, Numbers and Distribution. FWP recognizes the gray wolf as a native species and will integrate wolves as a valuable part of Montana's wildlife heritage. Wolves will be integrated and sustained in suitable habitats within complex management settings. The wolf program will be based on principles of adaptive management (Table 22). Management strategies and conflict resolution tools will be more conservative as the number of breeding pairs decreases, approaching the legal minimum. In contrast, management strategies become more liberal as the number of breeding pairs increases. Ultimately, the status of the wolf population itself identifies the appropriate management strategies. A minimum of 15 breeding pairs, according to the federal recovery definition (an adult male and an adult female with at least two pups on December 31) will be used as a signal to transition to more liberal or conservative management tools, whichever the case may be. This adaptive management trigger is not intended to be a minimum or maximum number of wolves "allowed" in Montana. FWP does not administratively declare an upper limit or maximum number of individuals of any wildlife species in the state in the sense of a "cap." Instead, FWP identifies population objectives that are based on landowner tolerance, habitat conditions, social factors, and biological considerations. Wildlife populations are then managed according to the objectives and current population status, using an array management tools. An adaptive approach will help FWP implement its wolf program over the range of social acceptance values. Sensitivity towards the challenges of wolf presence and prompt resolution of conflict where and when it develops is an important condition of not administratively capping wolf numbers or defining distribution.

Table 22. The spectrum of management activities to manage and conserve wolves in Montana. The adaptive management model calls for selection of different management strategies as the number of breeding pairs (according to the federal recovery definition) changes from 10-15 to greater than 15. The model also calls for different strategies, depending on landownership patterns (Public Lands and Mixed Land Ownerships), social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of breeding pairs or management settings, as indicated by the arrows.

	10-15 Breeding Pairs* ← | → **Greater than 15 Breeding Pairs ***			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish, Wildlife & Parks	Adaptive management →	→	→	→
	Integrate with ungulate management →	→	→	→
	Health and disease surveillance →	→	→	→
	Population monitoring	Enhanced population monitoring	Limited monitoring to determine pack status	Enhanced monitoring in selected areas

Table 22. Continued.

	10-15 Breeding Pairs* ← | → Greater than 15 Breeding Pairs *			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish Wildlife & Parks	Research to improve ecological understanding of wolf-ungulate interactions	→	→	→
	Research to evaluate specific management actions	→	→	→
	Law enforcement, high priority	→	Law enforcement standard activity	→
	Public outreach to inform and address specific needs	→	→	→
	Interagency, tri-state, tribal coordination	→	→	→
Wolf Conservation and Management Strategies	Summarize annual mortality; track breeding pairs numbers using USFWS definition	→	Summarize annual mortality; track pack numbers using combination USFWS definition and other techniques	→
	Ensure human safety; discourage wolf habituation	→	Discourage wolf habituation; more proactive removal of potential problem wolves	→
	No regulated hunting and trapping	No regulated hunting and trapping; licensed sportsperson may be used to resolve conflict with livestock in lieu of government response	Regulated hunting and trapping with FWP Commission oversight; conservative harvest on quota or permit system with mandatory reporting	Regulated hunting and trapping with FWP Commission oversight; harvest on quota or permit system with mandatory reporting; harvest quota more liberal as number of breeding pairs increase

Table 22. Continued.

	10-15 Breeding Pairs* ← | → Greater than 15 Breeding Pairs *			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Wildlife Services	Incremental approach, conservative	→	Incremental approach; lethal removal of problem wolves more liberal	Incremental approach; lethal may be 1st, especially on private land
Private Citizens	Non –lethal harassment Lethal take in defense of life/property	→ →	→ →	→ →

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably attain a minimum number of 10 breeding pairs with at least two pups on December 31.

By applying the federal recovery definition of breeding pair, FWP would incorporate an added measure of security and margin for error in the face of unforeseen future events, as well as greater flexibility for management decisions on a day-to-day basis. Successful reproduction would be documented as well. Because not every social group would meet the federal recovery definition as a breeding pair, more groups of wolves would also exist on the landscape in assurance that Montana's minimum contribution towards the tri-state total is achieved. As the Montana wolf population becomes more established, through the monitoring program, FWP will evaluate the more general definition of social group (four or more wolves traveling in winter) as a potential proxy for a breeding pair. (See Monitoring section below).

Wolf distribution in Montana, just as for all wildlife, will ultimately be defined by the interaction of the species' ecological requirements and human tolerance, not through artificial delineations. Social acceptance of wolves is highly variable across the landscape and among different landowners. As a wide ranging carnivore, gray wolves are capable of traveling long distances in relatively short periods of time and could cross many different property boundaries and land uses in a single day. Wolves will be encouraged on large contiguous blocks of public land, managed primarily as backcountry areas or national parks where there is the least potential for conflict, particularly with livestock. Wolf packs in areas of interspersed public and private lands will be managed like other free-ranging wildlife in Montana and within the constraints of the biological and social characteristics, the physical attributes of the environment, land ownership, and land uses. Some agency discretion and flexibility will be exercised to accommodate the unique attributes of each pack, its history, the site-specific characteristics of its home range, landowner preferences, or other factors that cannot be reasonably predicted at this time.

Management flexibility will be crucial to address all of the public interests that surround wolves. Wolf population management will include the full range of tools from non-lethal to lethal and will incorporate public outreach, conservation education, law enforcement, and landowner relations. An effective

management program should match the management strategies to the environments or setting in which each wolf pack occurs, recognizing that wolves interact with and respond to the environment in which they live, too. Potential management actions will be evaluated in light of prevailing conditions or extenuating circumstances. Wolf populations will fluctuate as a result of management actions, natural mortality, legal harvest, illegal killing, wolf productivity, and ungulate population fluctuations. If there are fewer than 15 breeding pairs in Montana, management tools are primarily non-lethal, particularly in backcountry settings and for public lands near national parks. Examples of non-lethal techniques include monitoring wolf locations using radio telemetry, changes in livestock husbandry practices, harassment, relocation, or attempts to modify wolf behavior. A minimum of 15 breeding pairs is required to use more liberal management tools, including lethal methods to resolve wolf-livestock, wolf-human conflicts, or concern over a localized prey population in light of the combined effects of predation and environmental factors.

When the wolf population no longer fits the definition of a species "in need of management" or when wolf numbers have increased and population regulation is needed, the FWP Commission may reclassify the wolf as a big game animal or a furbearer. The Montana Legislature would establish the license, fees, and penalties for illegal activities. The FWP Commission could then establish season structure and regulations to implement a public harvest program for wolves as it does for other hunting, trapping or fishing seasons. Initiating a public harvest program is a separate administrative process from this EIS. The FWP Commission follows a process that requires public notification of the proposal, public meetings, and a comment period of at least 30 days. The FWP Commission would initiate this process at a later date when a harvest program becomes biologically sustainable. The Montana Legislature would establish license fees and penalties.

Regulated public harvest of wolves by hunting and trapping during designated seasons will help FWP manage wolf numbers, fine tune distribution, and would take place within a comprehensive management program. Through public input and FWP Commission oversight, harvest regulations would describe legal means of take, and reporting and tagging requirements. Total harvest would be strictly controlled through a permit or quota system, with season closures as soon as harvest objectives are reached. As wolf numbers increase and distribution expands, harvest opportunity would increase. Specific harvest objectives will depend on other losses to the wolf population, such as control actions for livestock depredation or loss of a pack because of intraspecific strife. On a finer scale, wolves could be managed more conservatively on remote public lands or managed more liberally in areas with high livestock densities, depending on harvest objectives, district boundaries, and pack distribution. Regulated harvest and enforcement on Indian reservations would fall under the jurisdiction of the respective tribal governments and be coordinated with FWP management objectives. Hunting or trapping is not permitted in YNP or GNP. FWP's harvest management would proceed adaptively, but all hunting and trapping is precluded if there are fewer than 15 breeding pairs in Montana. The FWP Enforcement Division would enforce all laws, rules, and regulations just as it does for other legally classified wildlife species. Regulated wolf harvest would take place within the larger context of multi-species management programs, would be biologically sustainable, and would not compromise the investments made to recover the gray wolf. Within the context of a comprehensive program, regulated harvest should advance overall conservation goals by building social tolerance, interest in, and value for the species among those who would otherwise view wolf recovery as detrimental to their ungulate hunting experiences.

During the first five years after delisting, FWP will document that the Montana wolf population is secure and continues to meet the recovery criteria established by USFWS. FWP will informally consult with USFWS and cooperating partners on a regular basis, including a periodic formal review by USFWS. USFWS will point out any deficiencies or areas of concern and recommend corrective actions to FWP. FWP would take the necessary corrective measures to avoid a relisting of the gray wolf under ESA. FWP will undertake its own thorough, formal review after the first five years. Cooperating state and federal

agencies and tribal authorities may also participate. The wolf management program will be subsequently reviewed at least every five years. A more frequent review is provided for within the adaptive management model. By definition, the model incorporates monitoring and evaluation as an ongoing effort within the management program. Management is thus refined and improved through time as information and experience accumulate.

Managing wildlife populations that range across jurisdictional boundaries is always challenging, but especially when different management goals are identified on either side of the boundary. These differing goals and objectives may, in fact, be contradictory. Furthermore, adjoining management authorities are often bound by different sets of laws and policies. Under this alternative, FWP would coordinate with other agencies and responsible parties to resolve any concerns about how cross boundary packs would be managed or how conflicts would be resolved to make sure that park, provincial, tribal, as well as individual state, and tri-state goals are met. Overall conservation and management of boundary packs would proceed concurrently under each authority's plan or policies. Interagency and tribal coordination already takes place for other wildlife species through annual interagency meetings, working agreements, and informal contacts at the field level.

As part of the tri-state coordination effort, Montana may seek an agreement or MOU with Idaho and Wyoming to clarify which state counts which wolf packs within the context of their state's management program so that all wolf packs count toward the tri-state recovery requirement and individual packs are not missed or counted twice. Furthermore, this alternative clarifies Montana's intent that boundary packs should always count toward the 30-breeding pair tri state total for recovery and delisting purposes and that management authority and responsibility are actually shared between Montana and its neighbor, whether state, federal, provincial, or tribal. For the purposes of the Montana's adaptive management program and contribution to the tri-state total, FWP will tally breeding pairs that den within Montana's state boundaries toward the number of breeding pairs which ultimately determines whether liberal or conservative management tools are to be selected. If the actual den site is unknown, Montana and the adjacent state could seek an agreement on how the pack would be counted, using professional judgment or the assignment given by USFWS at the time of delisting.

Under this alternative, FWP would seek state legislation to make the unlawful taking of a gray wolf a misdemeanor under MCA 87-1-102. This statute makes it a misdemeanor to purposely, knowingly, or negligently violate state laws pertaining to taking, killing, possessing, or transporting certain species of wildlife. Including the gray wolf under this statute would be consistent with the inclusion of other legally classified wildlife species, such as deer, elk, moose, mountain lion, or black bear. Specific penalties (e.g. fines) under MCA 87-1-102 (2) would be determined at that time. FWP would also seek legislation to include the gray wolf under the restitution sections of MCA 87-1-111 that require a person convicted of illegally taking, killing, possessing certain wildlife species to reimburse the state for each animal or fish. Adoption of penalties and fines under Montana law in addition to FWP Commission rules is consistent with the council's recommendation that law enforcement be a high priority, that illegal activity be discouraged, and that penalties be similar to black bears and mountain lions. The Montana Legislature would address these in a future session.

FWP may reexamine the current 72-hour reporting requirement (MCA 87-3-130) when a wolf is killed or injured in defense of life or property. With modern communications, it may be reasonable to reduce that time in order to better facilitate examination and preservation of evidence and expedite resolution. The 72-hour reporting requirement outlined in MCA 87-3-130 applies to any legally protected wildlife species (e.g. deer, black bear, mountain lion) when a wild animal is killed in defense of life or property.

Social Factors. This alternative, initially based on the comments and recommendations of the Montana Wolf Management Advisory Council, and its Interagency Technical Committee, was updated to reflect

the significant amount of public comment received during scoping. This alternative builds upon the council's original planning effort and mirrors public comments calling on FWP to seek common ground between wolf advocates and those most directly affected by wolf presence. In addition, this alternative is based on calls for a balanced wolf management program that is consistent with modern scientific wildlife management practices and how FWP manages other large carnivores.

Administration, Delisting. Upon approval of plans from Montana, Idaho, and Wyoming, USFWS would propose to delist the gray wolf from ESA. When that administrative process is complete, management authority is transferred to the respective states in which wolves reside.

State laws and administrative rules become the regulatory and legal mechanisms guiding management. FWP and the FWP Commission will establish the regulatory framework to manage the species. FWP is responsible for implementing monitoring, research, law enforcement, public outreach, and other functions. The FWP Commission oversees FWP policy. A MOU will be signed by FWP, MDOL, and WS to address wolf-livestock conflicts. The Montana Legislature maintains its budget oversight authority. Ongoing interagency, tribal, and interstate coordination activities are important cornerstones of program administration.

FWP anticipates that the public will readily identify real or perceived problems or shortcomings of the program. The challenge for FWP will be to discern between earnest differences of opinion in preferred management direction and substantive shortcomings of the program. Difficult decisions will have to be made and will sometimes be called into question by various interests. However, the ensuing public dialogue will also help evaluate the program and lead to improvements. The Montana Wolf Management Advisory Council recommended that the State of Montana continue to engage a diverse advisory citizen's group to collaborate on wolf management.

Prey Populations. FWP would seek to maintain the public's opportunity to hunt a wide variety of species under a variety of circumstances in a sustainable, responsible manner. Wolf presence within the yearlong range of a specific ungulate herd adds a new factor that FWP biologists must consider among all environmental and human-related factors. FWP would integrate management of predators and prey in an ecological, proactive fashion to prevent wide fluctuations in both predator and prey populations (Table 23). To that end, FWP may increase or decrease hunter opportunity for either predators or prey species, depending on the circumstances. If reliable data indicate that a local prey population is significantly impacted by wolf predation in conjunction with other environmental factors, FWP would consider reducing wolf pack size. Wolf management actions would be paired with other corrective management actions to reduce ungulate mortality or enhance recruitment. Concurrent management efforts for wolves and ungulates would continue until the prey population rebounded, recognizing that by the time prey populations begin to respond they may be influenced by a new set of environmental factors.

FWP regularly surveys ungulate populations across a spectrum of their habitats. Information gathered from live populations is also supplemented by harvest information gathered at hunter check stations or through the telephone harvest survey. FWP will intensify ungulate monitoring efforts and consider habitat enhancement projects where wolf packs are established. Research will also improve ecological understanding of wolf-ungulate interactions and evaluate specific management actions for ungulates and/or wolves.

FWP further clarifies under this alternative that prey species are managed according to the policy and direction established by the programmatic review of the wildlife program (FWP 1999) and by species plans. Even though plans are written for individual species, the underlying foundation of those plans is based on an ecosystem perspective. These plans typically describe a management philosophy that protects the long term sustainability of the resource and aims to keep the population within management

objectives based on biological and social considerations. As recommended by the council, the gray wolf will be incorporated into ungulate management and future planning efforts.

Funding. FWP acknowledges that existing financial resources are not adequate. FWP will seek additional funding from a diversity of sources, including special state or federal appropriations, private foundations, or other private sources. The states of Montana, Idaho, and Wyoming are still investigating the idea of a grizzly bear/gray wolf trust fund that could be created through a special federal appropriation to fund the conservation and management of these two species of national significance. FWP will use state license money and matching federal funds to conserve and manage this native species on equal standing with other carnivores like mountain lions or black bears. License revenue will be used to partially fund the program since FWP intends to use regulated harvest as a management tool. The FWP personnel and financial resources necessary to fulfill the responsibilities of wolf conservation and management, law enforcement, human safety, public outreach, resolution of wolf-livestock conflicts, compensation, and program administration is an estimated $774,046 annually. The FWP budget reflects the comprehensive nature of designing and implementing a wolf program. It also reflects an extra $50,000 to fund increased efforts to reduce the risk of depredation and implement more proactive management strategies. Compensation program costs would be in addition to this amount. Compensation for livestock losses would be funded independently and not require the use of state funds. A detailed budget is presented in Chapter 4. Adequate funding from supplemental sources is required to implement all elements of this alternative.

Livestock / Compensation. Livestock producers and other landowners provide many benefits to the long-term conservation of gray wolves, not the least of which is the maintenance of open space and habitats that support a wide variety of wildlife, including deer and elk. At the same time, livestock producers may experience financial losses due to wolves. These losses tend to be sheep and young cattle, although occasionally llamas, guarding dogs or other livestock are lost. Some losses can be documented reliably but others cannot. Other financial hardships may be caused by livestock becoming stressed, injured, or trampling newborn young or by changes in husbandry or management practices to reduce risk of depredation.

FWP and MDOL will work together, along with WS, to address and resolve wolf-livestock conflicts through a MOU. FWP, in cooperation with MDOL, will contract WS to respond to landowner complaints, to conduct field investigations, and to carry out control activities for problem wolves. FWP has the ultimate responsibility for determining the disposition of wolves. See Table 24.

Addressing wolf-livestock conflicts will entail two separate, but parallel elements. One element will be management activities by WS and FWP to minimize the potential for wolf-livestock conflicts and to resolve the conflicts where and when they occur. Examples are providing technical assistance and taking actions that reduce the probability that the offending wolf or wolves will be involved in another depredation incident. This would be funded, administered, and implemented by the cooperating agencies. The second element addresses the economic losses of individual livestock producers through a compensation program when livestock are injured or killed by wolves. The two elements, management and compensation, are funded, administered, and implemented separately and independently of one another--but parallel one another, united in the goal of maintaining a viable wolf population and addressing economic losses.

Table 23. The spectrum of management activities to maintain viable populations of prey species. The adaptive management model calls for selection of different management strategies as the number of breeding pairs (according to the federal recovery definition) changes from 10-15 to greater than 15. The model also calls for different strategies, depending on landownership patterns (Public Lands and Mixed Land Ownerships), social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of breeding pairs or management settings, as indicated by the arrows.

	10-15 Breeding Pairs* ←		→ **Greater than 15 Breeding Pairs***	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish, Wildlife & Parks Management Strategies for Prey Species	Adaptive management	→	→	→
	Enhanced ungulate monitoring where wolves are present	→	Enhanced monitoring in selected areas	→
	Research to improve ecological understanding of wolf-ungulate interactions	→	Research to evaluate specific management actions	→
	Habitat enhancement projects	Habitat enhancement projects with cooperating landowners	Habitat enhancement projects	Habitat enhancement projects with cooperating landowners
	Adjust hunter opportunity to enhance prey populations	Adjust hunter opportunity to enhance prey subject to landowner tolerance	Adjust hunter opportunity to meet prey population objectives	Adjust hunter opportunity subject to landowner tolerance
	Integrate ungulate and carnivore management	→	→	→
	Public outreach to inform and to address specific needs; Emphasize landowner relations	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably maintain a minimum number of 10 breeding pairs with at least two pups on December 31.

Livestock producers would report any suspected wolf depredations (injuries or death) or the disruption of livestock or guarding animals to WS directly. If the investigating WS agent determines that a wolf or wolves were responsible, management response will be guided by the specific recommendations of the investigator, the provisions of this plan and by the multi-agency MOU. FWP would direct WS to take an incremental approach to address wolf depredations, guided by wolf numbers, depredation history, and the location of the incident. When wolf numbers are low and incidents take place on remote public lands, WS would use more conservative management tools. WS could apply progressively more liberal methods as wolf numbers increase and for incidents on private lands. Conflict history of the pack, time of year, attributes of the pack (e.g. size or reproductive status), or the physical setting will all be considered before a management response is selected. Management actions will be directed at individual problem wolves. Non-selective methods, such as poison, would not be used.

FWP may also approve lethal removal of the offending animal by livestock owners or their agents by issuing a special kill permit. A special kill permit is required for lethal action against *any* legally classified wildlife in Montana, outside the defense of life/property provision or FWP Commission approved regulations. FWP will not issue special kill permits to livestock producers to remove wolves on public lands when wolf numbers are low. If Montana had at least 15 breeding pairs, FWP may issue a special kill permit to livestock producers that would be valid for public and private lands. FWP will be more liberal in the number of special kill permits granted as wolf numbers increase and for depredations in mixed land ownership patterns.

In a proactive manner, FWP, WS, or other organizations will also work cooperatively with livestock producers with an increased emphasis on proactive efforts to reduce the risk of wolf-livestock conflicts. Extra effort would be into conflict prevention rather than responding after the fact. Landowners could contact a management specialist (FWP or WS) for help with assessing risk from wolves and identifying ways to minimize those risks – while still acknowledging that the risk of livestock depredation by wolves will never be zero. In addition, FWP could work to develop programs that provide livestock operations with additional benefits if they implement preventive approaches and maintain opportunities for wildlife, including gray wolves, on private lands and associated public grazing allotments. It may also involve state and federal land management agencies.

FWP would work with the livestock industry to identify sources of funding to accomplish preventative initiatives. Some funding could come from monies FWP already provides to WS for animal damage management in cooperation with MDOL. Some of those funds could be used to support the development and implementation of preventative programs and technical field assistance to landowners in identifying risks and preventative measures prior to any depredations. Private conservation groups are also working towards those ends. Defenders of Wildlife, through its Proactive Carnivore Conservation Fund, has already cost-shared preventative efforts like electric fencing or extra guarding dogs, as well as providing volunteer labor in the field. Conflict management would emphasize long-term, non-lethal solutions, but removing problem animals may still be necessary to resolve some conflicts. Considerations leading up to removal of wolves include persistent wolf activity, evidence of wounded livestock, the likelihood of additional losses if no action is taken, evidence of unusual attractants, and/or intentional feeding of wolves.

Beyond technical assistance from WS, FWP, and other collaborating partners, livestock producers (or their agents) may non-lethally harass wolves when they are close to livestock on public or private lands. Private citizens may also non-lethally harass wolves that come close to homes, domestic pets, or people. Upon delisting, private citizens could kill a wolf if it is threatening human life or domestic dogs. Livestock producers or their agents could also kill a wolf if it is attacking, killing, or threatening to kill livestock. This is consistent with Montana statutes that permit private citizens to defend life or property from imminent danger caused by wildlife.

The prohibition against indiscriminant killing of a wolf is similar to other legally classified wildlife such as big game (e.g. deer, black bear, mountain lion) or furbearers (e.g. martin, otter, or beaver). Montana law would require individuals to report incidents of wolf take to FWP within 72 hours. FWP would investigate to determine all of the facts or circumstances. Additional management tools (e.g. use of rubber bullets to haze wolves that frequent livestock concentration areas) and innovative approaches will arise on a case-by-case basis since each situation is unique.

Table 24. The spectrum of potential management activities to minimize the potential for wolf-livestock conflicts and the tools to resolve conflicts where and when they develop. The adaptive management model calls for selection of different management strategies as the number of breeding pairs (according to the federal recovery definition) changes from 10-15 to greater than 15. The model also calls for different strategies, depending on landownership patterns (Public Lands and Mixed Land Ownerships), social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of breeding pairs or management settings, as indicated by the arrows.

	10-15 Breeding Pairs* ← | → **Greater than 15 Breeding Pairs***			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Livestock Producers (cattle, calf, hog, pig, horse, mules, sheep, lamb, goat, guarding animal, emu, ostrich, poultry)	Lethal take in defense of life/property	→	→	→
	Non-lethal harassment	→	→	→
	WS response; technical assistance from WS, FWP, other	→	→	→
	No FWP special kill permit for public lands	FWP kill permit for private lands only; conservative number issued	Limited number of FWP kill permits for public lands	FWP kill permits for private or public lands; number issued more liberal
	No open season for designated trapper	→	Designated trapper or licensed hunter/trapper during open season	Designated trapper or licensed hunter/trapper during open season
Citizens (outfitters, hunters, recreationists)	Lethal take in defense of life/property	→	→	→
	Non-lethal harassment	→	→	→

Table 24. Continued.

	10-15 Breeding Pairs* ←		→ Greater than 15 Breeding Pairs*	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Wildlife Services	Technical assistance to producers, cooperation with FWP	→	→	→
	Activities directed by Memorandum of Understanding with Montana Fish, Wildlife & Parks and Montana Department of Livestock	→	→	→
	Incremental approach, conservative	→	Incremental approach	Incremental approach, liberal
Montana Fish, Wildlife & Parks	Technical assistance to producers, cooperation with Wildlife Services	→	→	→
	No special kill permits issued	Special kill permit administration and oversight; carcass retrieval	→	→
	Responsible for disposition of wolves involved in conflicts	→	→	→
	Public outreach to inform and address specific needs	→	→	→
	No open hunt/trap season	→	Conservative hunt/trap season where depredation is chronic	Hunt/trap season to maintain packs and minimize potential for conflict

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably maintain a minimum number of 10 breeding pairs with at least two pups on December 31.

This alternative clarifies wording from the original Council Planning Document pertaining to defense of life, property, or domestic dogs that could inadvertently mislead the reader. As a clarification of the language in this statute (MCA 87-3-130), FWP notes that *any* citizen may take a wolf protected by state law if it is attacking, killing, or threatening to kill a person or livestock, not just livestock producers or their agents. Furthermore, the *only* two legally classified wildlife species that can be injured or killed by a person defending a domestic dog without a special kill permit is the mountain lion or the gray wolf. A permit would be required for nuisance black bears or even deer. And, the mountain lion or gray wolf must be "attacking or killing" a domestic dog before a person could legally take the lion or wolf. The phrase "threatening to kill" does not apply in the context of defending domestic dogs. Human intervention in those situations must be non-injurious. Formal definitions of these terms may be adopted during subsequent administrative rule-making through the FWP Commission.

This alternative also clarifies the definition of "livestock" to mean cattle, sheep, horses, mules, pigs, goats, emu, ostrich, poultry, and herding or guarding animals (llama, donkeys, and certain special-use breeds of dogs commonly used for guarding or herding of livestock) for the purposes of addressing wolf-livestock conflicts. Dogs used for other purposes such as hunting or as pets are not covered under this definition. The defense of hunting dogs or dogs as pets is addressed under *Human Safety*. This alternative clarifies the term "non-lethal harassment" to refer to situations in which a wolf is discovered testing or chasing livestock and the owner attempts to scare or discourage the wolf in a non-injurious manner and without prior attempts to search out, track, attract or wait for the wolf. A special permit would be required to actually injure or kill the wolf or if a person purposefully attracted, tracked, or searched for the wolf.

This alternative would maintain and enhance the benefits of a compensation program. See Table 25. The State of Montana intends to find or create an entity to administer a compensation program. But compensation payments would not be made from FWP funds, matching federal funds intended for FWP programs, or from state revenue sources (e.g. taxes or the general fund). Defenders of Wildlife could be a partner. The entity or non-governmental organization would be independent of FWP to retain impartiality and negotiations would take place between the livestock owner and the independent administrator. Agency decision-making on the disposition of the problem animal is independent of the outcomes of the compensation negotiations. Upon receipt of a WS investigative report confirming wolf-caused losses, Defenders of Wildlife or some other independent entity would negotiate directly with the other to determine compensation. Producers would be compensated for confirmed and probable livestock losses at fair market value at the time of death and at fall value for young of the year. Livestock eligible for compensation include cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, and guarding animals. Domestic pets or hunting dogs would not be covered. Despite the present uncertainty of how a compensation program would be designed and administered, securing adequate funding for compensation is of equal priority as securing funding to implement the other state and federal agency management activities.

Compensation programs are appealing and may in fact contribute to long-term conservation goals. A group of private non-profit organizations, livestock organizations, the University of Montana, and multiple state and federal agencies have been working on a comprehensive analysis of compensation programs. Final results are expected in April 2003. These results, along with future input from the public or the Wolf Management Advisory Council, could be used to determine more specific details of a compensation program.

Table 25. Direction and guidelines for compensation of livestock losses due to wolf depredation in Montana. State of Montana intends to find or create an entity to administer a compensation program. The adaptive management model calls for selection of different management strategies as the number of breeding pairs (according to the federal recovery definition) changes from 10-15 to greater than 15. The model also calls for different strategies, depending on landownership patterns (Public Lands and Mixed Land Ownerships), social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of breeding pairs or management settings, as indicated by the arrows.

	10-15 Breeding Pairs* ← → **Greater than 15 Breeding Pairs***			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Livestock Producers (cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, guarding animals)	Incentives to reduce potential for conflict →	→	→	→
	Compensation and/or livestock insurance program for confirmed and probable losses at fair market value →	→	→	→
	No compensation for pets, alternative livestock →	→	→	→
Funding	Private donations and/or special state or federal appropriations (no FWP, matching federal or general state funds) →	→	→	→
Administration	State of Montana intends to find or create an entity to administer a compensation program; details pending final results of Compensation Research Study; Non governmental organization administers independently of FWP →	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably maintain a minimum number of 10 breeding pairs with at least two pups on December 31.

Wolf Habitat, Connectivity, and Land Management. FWP ungulate programs link habitat and population management through sustained public hunting to achieve ungulate population objectives. In this way, FWP takes an important habitat need of wolves into consideration. This, along with the amount of land held in public ownership and adequate legal protections, provides long-term habitat availability for wolves. Federal land management agencies are increasingly managing lands from an ecosystem-level perspective, considering all components and functional relationships. FWP will collaborate with private landowners as well to address concerns about wild ungulates or other habitat-related issues.

Recent scientific peer review of the USFWS definition of a viable wolf population indicated that human tolerance, strict regulation of human-caused mortality, long term management strategies, and maintenance of the genetic connectivity among sub-populations will determine the long term viability of a recovered population (USFWS 2002). Reviewers emphasized the regulation of human-caused mortality and the importance of connectivity to long-term population security. These are the standards by which the three state plans, when taken together, will be evaluated.

In more practical terms, this highlights the importance of assuring that there are frequent natural dispersal events in which individual wolves move between and among sub-populations in Montana, Idaho, and Wyoming. Dispersal, then, constitutes the "connection" that allows genetic mixing of sub-populations and ensures the viability of the entire northern Rockies population. Montana is an important geographic and physical link "connecting" these sub-populations with Canadian populations. Canadian national and provincial parks along the continental divide provide important secure habitats for wolves just north of the international boundary. However, wolf dispersal from the U.S. northward appears to be as important to the viability of Canadian sub-populations in southern British Columbia and Alberta as dispersal from there to the U.S. Canadian packs will likely continue to be a source of wolves dispersing into the U.S. while some U.S. wolves will continue dispersing into Canada. This exchange will be important to both U.S. and Canadian wolf populations.

By adopting the more specific federal breeding pair definition during the first few years of state-directed management, Montana will be assuring that adequate numbers of dispersal events occur. As wolf distribution slowly expands to suitable habitats with a minimal number of conflicts over time, the Montana population will still be a reliable source of dispersers within the bigger regional population. Across the wolf recovery area in the northern Rockies, Yellowstone and Glacier national parks function as core habitats at opposite ends of current wolf distribution. Adequate wolf numbers and distribution between those secure areas, legal protection, public outreach and education, and the network of public lands in western Montana, central Idaho, and northwestern Wyoming facilitates connectivity and dispersal between the sub-populations. The monitoring program and ongoing coordination with Idaho and Wyoming officials will ensure regional connectivity and adequate dispersal.

Specific habitat corridors, travel restrictions, or area closures are not incorporated in this alternative. They were not necessary to restore the gray wolf in Montana, and they should not be necessary to conserve and manage a recovered population. Nevertheless, the gray wolf and other wildlife species will benefit from linkage mapping efforts now underway for lynx and grizzly bears. FWP has attended technical meetings for these efforts and is a member of the Interagency Grizzly Bear Committee.

Economics / Livelihoods. The council acknowledged that the economic costs and benefits of wolf restoration in Montana accrue to individuals or economic sectors differently. Some individuals or economic sectors may benefit while others may be harmed. Thus, this issue is addressed in the Planning Document by the council's general recommendation to integrate and sustain a wolf population within the complex biological, social, economic, and political landscape. Furthermore, benefits and costs seem to affect individuals more significantly, rather than an industry as a whole. Therefore, this disparity is addressed through the inclusion of certain management tools or strategies such as those described in the

Livestock/Compensation and *Prey* sections. FWP, WS, and others would work proactively with individual livestock producers and other private landowners to address and minimize risk of economic losses associated with wolf conflicts. The council also acknowledged that some economic sectors benefit from the increased tourism and visitation associated with wolf-viewing and tourists' perception of Montana as a wild and scenic place to visit. The council also affirmed the USFWS assessment that restrictions on federal land management activities (e.g. logging or grazing) were not necessary for long term wolf management. No restrictions are suggested by this alternative.

Information / Public Outreach. This alternative acknowledges the importance, value, and need for an ongoing educational public outreach program that parallels wolf management activities. The objective is to provide scientifically based, factual information. A collaborative approach will also be necessary, but FWP will take the lead.

FWP already started its public outreach efforts with the 2002 Montana Hunting Regulations and the 2002-2003 Trapping Regulations. Tips and information were included to help hunters and trappers correctly identify a wolf from a coyote. FWP will take a leadership role in formulating and disseminating educational materials. FWP is aware of existing wolf-related educational materials and non-agency initiatives that could be incorporated in this important program component. These will be evaluated for future implementation.

Human Safety. FWP intends to reduce the potential for wolf-human conflicts and minimize the risks of human injury due to any large-sized canid. While the risk of an aggressive encounter with a wild wolf is low, FWP believes that the risk goes up in the absence of proper management. FWP will utilize extensive outreach to inform the public, aggressively discourage habituation of wild wolves, and respond to conflicts where and when they occur. See Table 26.

If a wolf (or similar large canid) loiters near ranch buildings or rural residences, FWP will evaluate the potential risk to human safety, taking into account the setting, behavior of the animal, and the sequence of events. Across the spectrum of wolf distribution and numbers, FWP will take an incremental approach. Potential actions include: increasing contacts within the local community and the media, closely monitoring the situation, radio collaring the animal to track its movements, aversive or disruptive conditioning, harassment, relocation, or lethal removal. A wolf could move through these areas, but length of stay and behavior will be important criteria for determining the appropriate management response. FWP will require some degree of flexibility to be most responsive to public safety concerns. Although the management responsibility related to wildlife and human safety rests with FWP, local law enforcement or other state or federal agency personnel may respond to a wolf-human incident if FWP personnel are not available in a timely manner. In the unlikely need to defend human life during a wolf encounter, citizens may use any means, including lethal force, to address an imminent threat. Citizens must notify FWP afterward. This general approach, consistent with FWP guidelines for mountain lions and black bears, would be adopted as nuisance wolf guidelines.

FWP will provide educational materials to the general public with information about appropriate responses during wolf encounters (do's and don'ts) and how to minimize the potential for problems near homes and rural schools. This material will also include information about wolf behavior, body posture, tail position, vocalizations, etc. to help the public evaluate the situation, correctly interpret wolf behavior, and communicate the details accurately to agency personnel. An educational effort will also help the public understand the differences between wolves, mountain lions, and bears in terms of animal behaviors, potential risk of injury, appropriate human responses when threatened, and how to live and recreate safely in the presence of these large carnivores.

Montana statute (87-3-130, MCA) allows a person to kill a wolf if the wolf is "attacking, killing, or threatening to kill" a person or livestock when there is an immediate and direct threat. This statute also allows a person to kill a wolf if it is "attacking or killing a domestic dog." Dog in this context refers to dogs kept as pets and hunting dogs. Dogs used for the purposes of herding or guarding livestock are discussed within the *Livestock/Compensation* section. See also the clarification above.

Table 26. Spectrum of management and public outreach activities to ensure public safety in Montana. The adaptive management model calls for selection of different management strategies as the number of breeding pairs (according to the federal recovery definition) changes from 10-15 to greater than 15. The model also calls for different strategies, depending on landownership patterns (Public Lands and Mixed Land Ownerships), social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of breeding pairs or management settings, as indicated by the arrows.

	10-15 Breeding Pairs* ←		→ **Greater than 15 Breeding Pairs***	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Citizens	Non –lethal harassment →	→	→	→
	Lethal take in defense of life/property →	→	→	→
Agency Personnel or Local Law Enforcement	FWP Guidelines for Nuisance Wolves →	→	→	→
	Non-lethal harassment →	→	→	→
	Lethal removal if threat to public safety →	→	→	→
Montana Fish, Wildlife & Parks	Public outreach to inform & address specific needs →	→	→	→
	Discourage wolf habituation →	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably maintain a minimum number of 10 breeding pairs with at least two pups on December 31.

Monitoring. FWP has the primary responsibility to monitor the wolf population, although collaborative efforts with other agencies and universities will be important. FWP will estimate wolf numbers and pack distribution, document reproduction, and tabulate mortality. FWP will also tabulate the number of breeding pairs meeting the federal recovery definition. Ecological understanding will also stem from documenting territory boundaries, the locations of wolf den and rendezvous sites, and identifying where significant wolf activity may be less desirable. While monitoring of the wolf population will help discern wolf population trends, wolf monitoring may also be conducted in the context of other wildlife management objectives related to prey species, such as identifying key wintering and spring wolf use areas and the prey species abundance and availability to wolves in those areas. The monitoring program will balance scientific precision with cost effectiveness. FWP will use a variety of tools, including radio telemetry and non-invasive techniques. Some social groups may be monitored more intensively than others, depending on the setting, landownership patterns, land uses, and prey species.

During the first five years post-delisting, FWP's monitoring program will have to be rigorous to demonstrate that adequate numbers of breeding pairs are present, that packs are reproducing, and that Montana's contribution to the tri-state recovery goal is met. FWP will monitor and tabulate packs according to the federal breeding pair definition to determine the appropriate adaptive management tools. Concurrently, FWP would also tabulate packs according to a more general definition of a social group, meaning "four or more wolves traveling in winter." While there is no guarantee that a group of four or more wolves traveling in winter would include young of the year, it is indicative of a socially cohesive group holding a territory and capable of reproduction. Four or more wolves traveling together will likely contain a male and female as an alpha pair and that has or will produce young in the spring. Determining counts in winter would follow the peak of human-caused mortality on adult wolves associated with summer/fall livestock grazing seasons, potential illegal mortality during the fall big game hunting seasons, and the harvest expected through regulated hunting and trapping seasons.

FWP will use the monitoring program to verify that the more general definition is adequate to document that the population is reproducing and secure. Once FWP becomes confident that the more general definition is adequate, it will be applied within the adaptive management framework and FWP would not monitor packs using the more rigorous federal recovery definition. Maintaining the federal recovery definition as the monitoring metric under adaptive management over the long term may be too stringent for a recovered population, especially in light of the difficulty in distinguishing pups from similar-sized adults in December and the expense of radio telemetry. USFWS data indicate that there is a significant correlation between the number of packs meeting the federal recovery definition as a breeding pair and the number of social groups according to the more general definition of four or more wolves traveling in winter, lending greater confidence that the more general definition will prove adequate.

FWP will coordinate with adjacent jurisdictions to monitor boundary packs, whether tribes, NPS, other states, or provinces. This type of coordination already occurs for other wildlife species.

Other Wildlife. Under this alternative, the gray wolf would become integrated into FWP's wildlife management program as the species integrates itself back into the natural environment. Other species of wildlife will benefit from the increased amount and availability of carrion while other species may compete for the same prey base, alter habitat use patterns to increase security, or even be killed by wolves. Overall, FWP's program seeks to conserve and manage wildlife from an ecological point of view rather than focusing on single species. Recognition of ecosystem functioning is also important.

Private Property. FWP recognizes that tolerance for wolves on private property is important to maintain the long-term security of a wolf population in Montana. Livestock damage in the context of private property is addressed above. Private property owners retain the right to grant or deny access to their

property by FWP, WS or other entities. Private property owners also retain the right to choose whether any wolf management activities or control actions take place on their property.

Hybrids. FWP would respond similar to USFWS response in Alternative 1 (No Action). Montana law assigns regulatory oversight of wolf-dog hybrid or captive wolf ownership to FWP. State law prohibits removing wolf pups from the wild. At the present time, state laws are thought to be adequate. Public outreach efforts will include identification techniques to discern a hybrid or captive wolf from a wild wolf. FWP biologists or game wardens will assist local authorities in making that determination and provide the appropriate management support to local authorities if necessary.

Wildlife Management Areas. Wolves will be able to occupy or hunt on WMAs, consistent with the philosophy that mountain lions and black bears inhabit these lands, too. While these lands were purchased with license revenue and are managed primarily for wintering ungulates, they also provide habitat for a variety of wildlife species and for public recreation opportunities.

WMAs frequently adjoin both public and private lands and may attract carnivores due to the concentration of deer and elk. Wolf occupancy may cause ungulates to alter habitat use patterns, which may provide some relief for chronically overgrazed areas. However, wolf occupancy may also redistribute wild ungulates to neighboring private lands, potentially generating other conflicts. FWP will work collaboratively to address this situation and resolve any conflicts, but will generally not remove individual wolves or wolf packs that use WMA lands.

Alternative 3. Additional Wolf

Under this alternative, FWP would adopt and implement the Montana Wolf Management Advisory Council's Wolf Conservation and Management Planning Document and the subsequent updates described in Alternative 2 (Updated Council), but with some modifications. Each issue is listed in the same chronological order as the other alternatives. If this alternative approaches the issue as the council had recommended, it will be stated and the reader is referred to Alternative 2 (Updated Council). If this alternative approaches the issue differently, the changes are described.

Upon federal delisting, provisions of SB163 take effect and wolves would automatically be reclassified under state law from "endangered" to a "species in need of management." This statutory classification confers full legal protection.

Implementation of this Alternative

Implementation of this alternative is contingent on securing adequate funding for all program elements. Implementation also requires FWP to develop and adopt final administrative rules and regulations under the "species in need of management" designation. The FWP Commission may then approve and adopt the administrative rules and regulations, including any special language pertaining to wolf management or how FWP would interpret relevant state laws. This alternative would form the basis of those administrative rules and regulations. Future FWP Commission action could reclassify the gray wolf as a big game animal or a furbearer when it becomes appropriate to do so. The FWP Commission would concurrently establish regulations pertaining to management and regulated harvest under the new species designation. The Montana Legislature would establish a wolf license for regulated public harvest, the license fee, penalties for illegal take, and the restitution value. MOUs must also be finalized with MDOL and WS. FWP may seek to develop MOU's or cooperative agreements with Indian tribes to coordinate management and clarify roles and responsibilities.

How Does this Alternative Address the Major Issues?

Wolf Management, Numbers and Distribution. Under this alternative, FWP would recognize the gray wolf as a native species and its management would be integrated within the wildlife program, as described for Alternative 2 (Updated Council). However, the adaptive management framework described for Alternative 2 would be modified to increase from 15 to 20, the number of breeding pairs (by the federal recovery definition) required to transition from conservative to liberal management tools. All other aspects of Table 22 remain the same.

Social Factors. This alternative uses Alternative 2 (Updated Council) as a baseline, yet presents a different management scenario in which greater numbers of breeding pairs would be required prior to implementing liberal management tools. The social factors underlying this alternative originate in public comments expressing general support for FWP to manage the gray wolf similar to other large carnivores, but to do so conservatively and with greater numbers of wolves on the landscape.

Administration, Delisting. Same as Alternative 2 (Updated Council), with one exception. Under this alternative, FWP would organize an annual workshop and interagency coordination meeting instead of working with a "standing" advisory council. The emphasis would be on citizen input and participation in the spirit of problem solving and on agency accountability back to the public. Participation by diverse interests would be encouraged. Montanans and agency personnel would have the opportunity to identify and discuss issues as well as brainstorm solutions in an informal, non-confrontational atmosphere. Technical experts and decision makers would be present to listen, answer questions, provide information, as well as to formulate strategies for addressing the issues raised. Because other agencies have authority and jurisdiction to address the issues identified by the public, such as the federal land management agencies, their participation is strongly encouraged. The overall emphasis would be program evaluation, refinement of policy, and on the initial stages of establishing new policy or management direction in response to unforeseen developments. Potential outcomes of these coordination meetings include potential changes in FWP management strategies that could involve the FWP Commission or the Montana Legislature at a later time. Other outcomes may be enhanced understanding, improved communication, and continued involvement by all Montanans, not just a representative council.

The FWP Commission fulfills some of the same functions as an advisory council in that it is comprised of citizens, discusses issues and sets policy direction. FWP Commissioners would be encouraged to attend the workshop and interagency meetings.

Prey Populations. Same as Alternative 2 (Updated Council). See Table 23.

Funding. Same as Alternative 2 (Updated Council), with one exception. Under this alternative, the State of Montana would not find or create an entity to administer an independent compensation program (see below) and that line item would not be reflected in the budget. The estimated FWP budget for this Alternative is $799, 046. Compared to Alternative 2, this alternative increases the budgeted amount for enhanced ungulate monitoring (from $50,000 to $75,000). A detailed budget is presented in Chapter 4.

Livestock / Compensation. Under this alternative, FWP would address wolf-livestock conflicts as recommended by the council in Alternative 2, using the same management framework and tools. Landowners would still be able to contact a management specialist (FWP or WS) for help with assessing risk from wolves and identifying ways to minimize those risks—while still acknowledging that the risk of livestock depredation by wolves will never be zero. In addition, FWP would work to develop programs that provide livestock operations with additional benefits if they implement preventive approaches and maintain opportunities for wildlife, including gray wolves, on private lands and associated public grazing allotments. It may also involve state and federal land management agencies.

Under this alternative, improved management and enhanced flexibility for the agency and the landowner would be substituted for a compensation program. Compensation for livestock injury or loss due to wolves was instituted by a private organization since the federal government and the State of Montana do not financially reimburse individuals for losses because of damage caused by wildlife. The Defenders of Wildlife Wolf Compensation Trust Fund has paid a total of $81,140 for wolf-related claims in Montana since 1987 (data obtained 9-3-2002 from www.defenders.org/wolfcomp.html). But under this alternative, the State of Montana would not actively promote, create, or facilitate an independent compensation provider to fund and administer a compensation program should the existing private program be discontinued. At the present time, no compensation programs are facilitated, created, or administered by FWP for large carnivores or other wildlife species in Montana. Historically, management response and technical assistance, whether carried out by agency personnel or by landowners, have been the traditional and legal basis for addressing wildlife-livestock conflicts in Montana.

Many public scoping comments identified concerns about a compensation program, and these are briefly summarized as follows. Compensation relies on verification, and this is not easily accomplished in Montana's multi-predator, mountainous environment. It also requires assessment of value, which can vary considerably--not every animal has the same value. For example, purebred lines of sheep and cattle are valued more highly than the simple market price of a cow or sheep at auction. Specific individuals in those genetic lines may be of even greater value. Compensation programs also require perpetual fund-raising, with uncertain results and future availability. Complications further arise from the logistics of how losses are documented and which types of livestock are covered. Even after compensation is paid, some type of field response may still be necessary because of the potential for subsequent incidents. Compensation programs typically do not take into account the changes that livestock producers make in management operations or the economic costs associated with making those changes. Fundamentally, compensation addresses a problem only after it has occurred by reimbursing livestock owners for the financial losses incurred when livestock are injured or killed.

Instead of a compensation program, this alternative would provide landowners with management flexibility within the guidelines of Montana law and the administrative rules that will be adopted by the FWP Commission. Montana law makes it illegal to indiscriminately kill a wolf unless the wolf is "attacking, killing, or threatening to kill a person or livestock." The prohibition against indiscriminant killing is similar to other legally classified wildlife such as big game (e.g. deer, black bear, mountain lion) or furbearers (e.g. martin, otter, or beaver). Montana law would require individuals to report incidents of wolf take to FWP within 72 hours. FWP would investigate to determine all of the facts or circumstances. The actual management tools proposed for landowner use in this alternative were described under Alternative 2 (Updated Council). Additional management tools (e.g. use of rubber bullets to haze wolves that frequent livestock concentration areas) and innovative approaches will arise on a case-by-case basis since each situation is unique.

Wolf Habitat, Connectivity, and Land Management. Same as Alternative 2 (Updated Council).

Economics / Livelihoods. Same as Alternative 2 (Updated Council).

Information / Public Outreach. Same as Alternative 2 (Updated Council). See Table 22.

Human Safety. Same as Alternative 2 (Updated Council). See Table 26.

Monitoring. Same as Alternative 2 (Updated Council). See Table 22. However, under this alternative, the overall wolf monitoring intensity may decrease because a higher number of social groups will be present in Montana so a high degree of precision is less warranted. Some groups could be still monitored closely (e.g. groups which use private lands) while others may be monitored less intensively.

Other Wildlife. Same as Alternative 2 (Updated Council).

Private Property. Same as Alternative 2 (Updated Council).

Hybrids. Same as Alternative 2 (Updated Council).

Wildlife Management Areas. Same as Alternative 2 (Updated Council).

Alternative 4. Minimum Wolf

Under this alternative, FWP would develop and adopt a wolf conservation and management program that meets the minimum standards for a secure, viable wolf population. It maintains the fewest wolves possible to fulfill the legal requirement of wolf recovery. It represents the most aggressive management philosophy and the lowest tolerance for wolf presence. Most of the underlying philosophies and guiding principles endorsed by the Council are stripped away, although many of the same management tools remain. This alternative most closely matches the "no wolf" sentiment expressed in some public comments, but a strictly "no wolf" alternative was not considered for further development because it is outside the sideboards of federal wolf recovery.

Upon federal delisting, provisions of SB163 take effect and wolves would automatically be reclassified under state law from "endangered" to a "species in need of management." This statutory classification confers full legal protection.

Implementation of this Alternative

Implementation of this alternative is contingent on securing adequate funding for all program elements. Implementation also requires FWP to develop and adopt final administrative rules and regulations under the "species in need of management" designation. The FWP Commission must then approve and adopt the administrative rules and regulations, including any special language pertaining to wolf management or how FWP would interpret relevant state laws. This alternative would form the basis of those administrative rules and regulations. Future FWP Commission action could reclassify the gray wolf as a big game animal or a furbearer when it becomes appropriate to do so. The FWP Commission would concurrently establish regulations pertaining to management and regulated harvest under the new species designation. The Montana Legislature would establish a wolf license for regulated public harvest, the license fee, penalties for illegal take, and the restitution value. MOUs must also be finalized with MDOL and WS.

How Does this Alternative Address the Major Issues?

Wolf Management, Numbers and Distribution. This alternative grows out of the public comments suggesting that gray wolves don't belong in Montana and that their presence through recolonization and reintroduction is entirely incompatible with the modern landscape. In the eyes of one citizen, "Montanans were forced to accept these wolves." The underlying philosophy of this alternative is one of minimal tolerance for wolf presence on both public and private lands. Because Montana is "forced" to sustain some wolves and that conflicts will occur and may be unresolvable, the approach will isolate wolves from the rest of the FWP's wildlife management program.

Modern scientific wildlife management principles have limited application under this alternative. The gray wolf would not be treated as a native wildlife species and it would be managed differently from mountain lions and black bears. Wolves would be managed as closely as possible to a legally classified

predator such as the coyote, while still meeting the definition of "species in need of management" which provides a legal protection not extended to the coyote. Adaptive principles would not apply. Management tools would be aggressive and liberal most of the time in contrast to the incremental approach of Alternative 2 (Updated Council) and Alternative 3 (Additional Wolf).

Wolf numbers would be capped at 10 breeding pair (federal recovery definition), which is Montana's expected minimum contribution towards the tri-state total of 30 pairs. More than 10 social groups will be required to achieve 10 breeding pairs as defined by the recovery definition because not every group successfully reproduces. FWP would tabulate the number of breeding pairs according to the federal recovery definition -- a male and a female with at least two pups on December 31. Total numbers will be fine-tuned to maintain only as many breeding pairs and social groups as necessary. Wolf distribution would be artificially zoned so that wolves would be strongly discouraged in eastern Montana and may in fact be routinely trapped and relocated to western Montana or removed from the population if suitable release sites could not be found. Wolves would be permitted in FWP administrative Regions 1, 2, and 3, and portions of Regions 4 and 5. The eastern boundary line would correspond to boundaries for FWP Regions 6 and 7. Wolf presence in portions of Regions 4 and 5 would be tolerated, depending on whether wolves occurred in large blocks of public land or in mixed ownerships where conflicts were likely. Wolf use of private lands would be at the discretion of the landowner, one step shy of prohibiting wolves on private lands since some landowners may tolerate wolf use. Capping wolf numbers and administratively defining (or zoning) wolf distribution requires aggressive management tools and a liberal interpretation of management flexibility for both agencies and landowners. Other aspects of how wolves would be managed under this alternative are listed in Table 27.

Social Factors. This alternative represents the most liberal, exploitive management approach of the five alternatives. The social factors underlying it originate in public comments expressing dissatisfaction with why or how wolves got to Montana and opinions that wolf presence can't be accommodated in these modern times for a variety of reasons, including unacceptable impacts to livestock producers and big game populations. Rather than "getting" to manage wolves, FWP "has to" and it is a "cost." This alternative most closely addresses public comments calling for the removal of all wolves from Montana.

Administration, Delisting. Same as Alternative 2 (Updated Council). However, individual landowners would carry relatively more responsibility for management activities on private lands in lieu of agency response compared to Alternatives 2 (Updated Council) and 3 (Additional Wolf). FWP will provide as many special kill permits as possible to interested landowners for wolf control actions on their private property. WS will still respond to wolf-livestock complaints, provide technical assistance to landowners, and aid in restricting wolf distribution to western Montana.

Prey Populations. Under this alternative, wolf predation on big game populations would be minimized out of the concern that wolf predation may compete with human hunter harvest at a 1:1 ratio and is an additive form of mortality for prey populations under most circumstances. This would be accomplished by the overall aggressive management activities of this alternative, such as capping total numbers, the liberal provisions for landowners to kill wolves on private lands, limiting overall distribution, and restricting wolf use of FWP WMAs. Prey populations would be monitored less intensively than Alternatives 2 (Updated Council) and 3 (Additional Wolf) because fewer wolves would be present.

Table 27. Wolf management strategies to maintain the minimum number of breeding pairs required in Montana under Alternative 4 (Minimum Wolf).

	Wolf Management Strategies to Maintain the Minimum Required
Montana Fish, Wildlife & Parks	Minimum number of breeding pairs and social groups required; distribution limited to western Montana and mostly on public lands Management liberal most of the time; management not adaptive; independent from rest of wildlife programs Minimum health and disease surveillance Intense monitoring required, with heavy reliance on radio telemetry Limited or no research to improve ecological understanding or evaluate management actions Law enforcement a low priority beyond administration of special kill permit programs and retrieval of wolf carcasses legally killed under special permits Public outreach emphasizes landowner contacts to inform them of wolf activity in an area; outreach also to addresses human safety concerns Significant interagency and interstate coordination required Ensure human safety; discourage wolf habitation Limited and potentially inconsistent opportunity for public hunting and trapping since many wolves would be killed through other management/control activities Liberal number of special kill permits available to landowners Management for boundary packs overlapping national parks, tribal reservations, Canada, Idaho, or Wyoming more conservative than for other packs since national parks would be an important contribution towards Montana's total number No Advisory Council or annual citizen invitation to interagency coordination meetings
Wildlife Services	When the wolf population is above the minimum, aggressive management and control to prevent establishment of new packs, especially on private property and in eastern Montana, and where there is a potential for wolf-livestock conflicts Technical assistance to landowners Field investigations and management response; lethal control first on private lands but response could be more incremental on public lands when wolf population close to the minimum standard and for packs near national parks
Citizens	Non-lethal harassment on private lands Lethal take in defense of human life or livestock on public or private lands if wolf "attacking, killing or threatening to kill" a person or livestock; may take a wolf if it is "attacking or killing" a domestic dog May receive special kill permit to remove wolves on private land; public land if there is a history of wolf-livestock conflicts; landowner could use designated trapper; number of permits liberal

Funding. Under this alternative, the wolf program would be funded entirely by special federal appropriations, since the role of licensed hunters and trappers is expected to be minimal and the gray wolf would not be integrated into the broader context of a scientific wildlife management program. This alternative is the most expensive alternative to implement.

The estimated FWP budget for this alternative is $821,925. It requires increased FWP personnel and operations money to do the necessary wolf monitoring because the population would be managed so closely to the minimum required. Because each individual wolf becomes more "valuable" to the overall population, a high degree of precision is necessary to ensure that management decisions do not jeopardize the population and trigger a relisting. Additional personnel and operations money would be required for administration of the special kill permit program through the FWP Enforcement Division since wolf management on private lands is expected to be so aggressive. Additional funding would also be needed to inform private landowners when wolves are in the area. Because of the high degree and frequency of coordination required between FWP regions, between Montana and the other states, and likely with USFWS, administrative costs are expected to increase. The budgeted amount for WS would decrease because there would be fewer wolves in Montana, and landowners could be responsible for most conflict resolution on private lands. The budget would not include compensation (see below).

Livestock / Compensation. Under this alternative, there is little tolerance for wolves on private property. FWP would be as liberal as possible in the number of special kill permits issued to livestock producers and other private property owners in the vicinity, while maintaining the minimum number of wolves required (Table 28). Livestock producers could still kill wolves caught "attacking, killing, or threatening to kill" their livestock and the FWP Enforcement Division would still investigate defense of property incidents. Because of the underlying premise of liberal, aggressive wolf management to limit wolf numbers and distribution, with landowner participation, livestock losses would be minimized to the extent possible. Therefore, a compensation program is not included under this alternative.

Wolf Habitat, Connectivity, and Land Management. Under this alternative, Montana's connectivity requirement would be met through a trapping/relocation program to artificially simulate the natural dispersal events required to ensure long-term genetic viability. Survival of relocated wolves has not been empirically determined for Montana wolves. Therefore, a strong reliance on the core habitats provided by national parks would be necessary because these packs could more reliably provide dispersing individuals. In addition, these packs would be managed more conservatively than other packs. No specific habitat corridors, travel restrictions, or area closures are incorporated in this alternative.

Economics / Livelihoods. This alternative favors the economic interests of livestock producers and the interests of big game hunters because aggressive management would limit wolf numbers and distribution—and presumably the impact of wolves on livestock and ungulate populations. However, some landowners may incur some expenses in carrying out wolf management activities on their private properties. YNP would still be a prime wolf-viewing destination. But, outside YNP, ecotourism and wildlife-viewing interests would not be given much consideration under this alternative.

Information / Public Outreach. The alternative expands the outreach efforts in Alternatives 2 (Updated Council) and 3 (Additional Wolf) to include significantly greater FWP communication and coordination with individual landowners due to the high number of special kill permits available. Under this alternative more so than any other, FWP would also notify landowners when wolves are known to be in the area. Frequent notification is added to this alternative in response to public comment gathered during scoping.

Table 28. Potential management activities that address wolf-livestock conflicts under Alternative 4 (Minimum Wolf). Management actions and the number of special kill permits become more liberal with increasing numbers of breeding pairs above the recovery goal.

	Wolf Management to Maintain the Minimum Required	
	Defense of Life/Property	**Livestock Protection**
Landowners and Livestock Producers (or their agents)	Could harass, injure or kill a wolf in defense of human life or livestock without permit on public or private lands if the wolf is "attacking, killing, or threatening to kill" a person or livestock Could harass, injure, or kill a wolf in defense of a domestic dog if the wolf is "attacking or killing" the domestic dog	May receive special kill permit from FWP for private land or public land if wolf-livestock conflicts; maximum number available to keep number of breeding pairs at the minimum May non-lethally harass wolf May hire designated trapper to fill special kill permit
Citizens (outfitters, hunters, recreationists)	Could harass, injure or kill a wolf in defense of human life or livestock without a permit on public or private lands if the wolf is "attacking, killing, or threatening to kill" a person or livestock; Could harass, injure, or kill a wolf in defense of a domestic dog if the wolf is "attacking or killing" the dog	May non-lethally harass
Wildlife Services		Provides technical assistance to landowner and investigates complaints Management actions to harass, relocate, or kill wolf if on public land; lethal control on private land
Montana Fish, Wildlife & Parks	Provide technical assistance Relocate, harass, or kill wolf	Provide technical assistance Administers special kill permit program Tabulate mortality

Human Safety. Same as Alternative 2 (Updated Council).

Monitoring. Under this alternative, the monitoring program is much more intensive than the other alternatives. This is because FWP will be managing the wolf population very close to the minimum requirements to keep the northern Rockies population from being relisted. Pack status must be known with a high degree of certainty. The monitoring program will rely heavily on radio telemetry so that packs could be found readily to notify landowners when wolves are in the area and so that pack status is monitored on an ongoing basis. FWP would do whatever was necessary to keep at least one radio collar in as many social groups of wolves as required in order to document 10 breeding pairs meeting the federal recovery definition. A significant commitment of FWP resources and field personnel to trap and monitor packs would be required in order to achieve the necessary precision when the wolf population so close to the minimum standard.

Other Wildlife. Benefits of wolf presence to other wildlife (like scavengers) are minimized due to minimal wolf numbers and limited distribution. Conversely, other wildlife species, such as beaver, which are prey for wolves, may benefit from the wolf low numbers. Under this alternative, the gray wolf is not integrated into FWP's wildlife management program, but other species will continue to be managed in the presence of a limited wolf population.

Private Property. The alternative is more deferential to private property owners' decisions about wolf use of their lands. Since wolves would not be treated like other publicly owned wildlife, landowners would be granted greater latitude to resolve conflicts so long as the overall wolf population in Montana remained above the minimum required. See *Livestock* issue above.

Hybrids. Same as Alternative 2 (Updated Council.) See Table 22.

Wildlife Management Areas. As noted above, wolf distribution under this alternative is administratively determined and artificially maintained through management and control. Wolves would be discouraged from using FWP WMAs. FWP field personnel could haze and trap/relocate wolves discovered on WMAs. Individual wolves will be allowed to cross FWP properties, but ideally, would not be allowed to stay long enough to hunt deer or elk.

Alternative 5. Contingency

Under this alternative, FWP would seek to enter into a cooperative agreement with USFWS to implement the Updated Council Alternative (2) while the gray wolf is still listed as an interim step to assuming full management authority in the event that delisting is postponed. Delisting delays could be caused by the lack of conservation plans and/or adequate regulatory mechanisms in the other two states or by litigation on the actual USFWS delisting proposal. The public anticipated delays and expressed their concerns about developments beyond Montana's control during the scoping process. In response, FWP developed this unusual alternative.

This alternative allows FWP to respond to citizens' needs and address the challenges faced by those most directly affected by wolf presence, albeit more conservatively than FWP or the public may desire, until such time as the wolf is delisted and under full authority of the state. It may not be legally possible to implement some provisions, such as regulated public harvest, because of the listed status but many other aspects would be.

FWP believes inclusion of this alternative is important because gray wolves will continue to increase their numbers and distribution in Montana while the administrative process for delisting runs its course. Gathering public comment on it now as part of the EIS process allows FWP to hear from Montanans about the future of wolf management under a different set of legal conditions should wolves not get delisted in the near future. The significance or duration of any delay is speculative at this time. Nonetheless, this alternative outlines a potential approach that would allow FWP to become more involved in the day to day management of wolves in Montana than is presently the case.

Even if FWP selected this alternative as an interim management program while the delisting process is ongoing, FWP would continue working with USFWS and the states of Idaho and Wyoming to resolve any obstacles to complete delisting and the transfer of management authority from the federal government to the respective state governments. Upon delisting, FWP would implement the remaining program elements of Alternative 2 (Updated Council) that had previously been prohibited by federal regulations.

Implementation of this Alternative

Section 6 of ESA provides an opportunity for cooperative agreements between USFWS and the states for the conservation of endangered or threatened species. Implementation of this alternative would involve FWP modifying the existing Section 6 agreement with USFWS to include wolf conservation and management. USFWS may have to fulfill other administrative responsibilities prior to implementing this alternative. FWP would implement the Updated Council Alternative (2) to the extent allowable by federal law (and existing rules) while the species is still listed. The State of Montana would be the primary decision maker. USFWS would maintain some oversight authority to assure that FWP does not violate the agreement, violate ESA or federal rules, or stray outside the provisions outlined in this alternative. USFWS would annually review the state's program. WS would still investigate and resolve wolf-livestock conflicts as described in Alternative 2 (Updated Council). Implementation of this alternative is contingent on securing adequate funding from federal and private sources for all program elements.

FWP and USFWS would renew the agreement, even modify it when and where necessary, until all three states have acceptable management plans and adequate regulatory mechanisms, USFWS has completed its delisting process, and any litigation delaying the transfer of management authority is resolved.

Upon delisting, FWP would take the administrative steps necessary, including MEPA compliance, to adopt and implement the remaining provisions of the Updated Council Alternative (2) that had been prohibited by federal law. State laws and regulations would then fully guide the program, including SB163 provisions that reclassify the gray wolf from "endangered" to a "species in need of management." This classification confers full legal protection.

There is an important caveat to this alternative that would affect FWP's decision whether to implement it should delisting get delayed. In 2000, USFWS proposed new rules that would downlist wolves in the Northwestern Montana Recovery Area from "endangered" to "threatened." The new rules, if finalized, would provide for greater agency flexibility in resolving conflicts. If USFWS does not adopt the final rule, FWP would no longer consider implementing this alternative. FWP would be precluded from implementing nearly all aspects of Alternative 2 (Updated Council) because wolves would still be "endangered" in northwestern Montana and FWP would have very limited management flexibility. FWP expects USFWS to announce the decision in the near future.

How Does this Alternative Address the Major Issues?

Wolf Management, Numbers and Distribution. FWP would implement all the conservation and management elements outlined in the Updated Council Alternative (2) that are consistent with and allowed by federal law and regulations (see Table 22). Nearly all aspects would be allowed in some form or another, but the circumstances by which gray wolves could be injured or killed is an important exception because wolves would still be listed under ESA. Regulated harvest of wolves through hunting and trapping is not possible under this alternative. Furthermore, special kill permits issued by FWP to address wolf-livestock conflicts would be subject to the same provisions as the federally issued permits. These permits are discussed in greater detail in the *Livestock / Compensation* section below.

Social Factors. The social factors underlying a balanced, responsive program, as described in Alternative 2 (Updated Council), are also reflected in this alternative. Additionally, the alternative responds to Montanans' concerns that they could be negatively affected by increases in wolf numbers and distribution and a lack of management authority by Montana if the wolf was not delisted in a timely manner. Many citizens commented that it seemed unfair for Montanans to be negatively affected by delays beyond their

control and that, in the absence of a more proactive program, conflicts would become increasingly severe and difficult to resolve.

Administration, Delisting. Under this alternative, the gray wolf would still be federally listed and classified as "experimental, non-essential" in the Yellowstone and Idaho recovery areas. In the Northwestern Montana Recovery Area, the gray wolf is currently classified as "endangered." However, in 2000, USFWS proposed new rules that would downlist wolves in the Northwestern Montana recovery area from "endangered" to "threatened." The new rules, if finalized, would provide for greater agency management flexibility, particularly in resolving conflicts. If the final rule was similar to the original proposal, FWP could implement most elements of this alternative. Federal rules and regulations would apply as they were published, either in the experimental areas or the Northwestern Montana Recovery Area. There are few differences between the federal rules applicable to each area, but any differences could be addressed in the FWP/USFWS agreement so that management would be more consistent across Montana.

Prey Populations. Same as Alternative 2 (Updated Council), with one exception. FWP would still integrate the wolf management with ungulate management as described for Alternative 2. However, FWP's wolf management tools would be limited to relocation if reliable data indicate that a local prey population is significantly impacted by wolf predation in conjunction with other environmental factors. Regulated harvest could not be used to reduce pack size while wolves are still listed under ESA.

Montana's final plan will need to describe what the adverse impacts are, how they will be measured, and identify possible mitigation measures. Before FWP initiates capture and relocation efforts, USFWS would need to approve the state's final plan and determine that such actions will not inhibit wolf population growth toward recovery. USFWS may itself, in cooperation with FWP, capture and relocate wolves. FWP's prey monitoring efforts are an important aspect to assessing wolf predation effects on ungulate populations. Hunter opportunity for ungulates will still fluctuate according to ungulate population status – as it is influenced by weather, predation, previous hunter success, etc.

Funding. Funding to implement this alternative would be split between Montana and the federal government because the species would still be listed and Montana lacks a significant source of funding dedicated to ESA-listed species. Section 6 of ESA provides for 90% of the funding, but Montana would need to fund the remaining 10%. This 90-10 cost share is also predicated on the condition that Montana continues to coordinate with the other states to recover and delist the gray wolf, which most certainly will be the case. FWP would fund its share either through private sources or by state license revenue. Although regulated harvest of wolves is not allowed, this alternative would allow wolves to be relocated if a localized ungulate population were significantly impacted. In anticipation of delisting, FWP would still be trying to secure funding for the day when Montana assumes full management authority.

The estimated FWP budget for this alternative is $699,046. The costs of a compensation program would be in addition to that amount. Compared to Alternative 2 (Updated Council), this alternative requires that WS continue to obtain the funding for resolution of wolf-livestock conflicts from federal sources through a combination of Congressional appropriations and USFWS, as is currently the case. FWP would still direct $50,000 towards increased efforts to minimize the risk of wolf-livestock conflicts and proactive management strategies.

According to this alternative, the State of Montana intends to find or create an entity to administer a compensation program. This is reflected in the detailed budget presented in Chapter 4, but the funds would not be sourced from FWP funds, matching federal funds, or other state revenue.

Livestock / Compensation. Same as Alternative 2 (Updated Council), except that actions by livestock producers, WS, and FWP that would harass, injure, or kill wolves in conflict with livestock are guided by federal law and regulations. The federal regulations are similar to Alternative 2 (Updated Council) in that they are intended to promote flexibility for landowners and agencies to resolve conflicts by directing management response at problem wolves. The specific management tool most readily available to livestock producers to resolve conflicts is a permit that authorizes someone to take a wolf under certain conditions. These are similar to the state's special kill permit described under Alternative 2 (Updated Council). However, the federal regulations are more restrictive, in keeping with the ESA-listed status. The conditions are described in Table 29. It is important to note that while the adaptive management framework still guides the incremental approach, taking of wolves under the federal regulations is guided by whether the conflict took place on public or private land, not whether it took place on remote public lands or mixed land ownerships, as is the case in Alternative 2 (Updated Council).

This alternative would maintain and enhance the benefits of a compensation program, as described for Alternative 2 (Updated Council). See Table 25.

Wolf Habitat, Connectivity, and Land Management. Same as Alternative 2 (Updated Council).

Economics / Livelihoods. Same as Alternative 2 (Updated Council).

Information / Public Outreach. Same as Alternative 2 (Updated Council).

Human Safety. Same as Alternative 2 (Updated Council). FWP clarifies that current federal regulations do allow a person to take a wolf in defense of their life or that of another. The wolf must pose an immediate and direct threat. The incident would need to be reported to FWP within 24 hours according to federal regulations, rather than 72 hours under state law. Reasonable accommodation may be allowed for incidents taking place in remote backcountry settings. Federal regulations also allow FWP to remove a wolf that the agency determines to be a demonstrable, but not immediate threat to human life or safety. The federal regulations are similar to what is described in Table 26.

Monitoring. FWP would take the lead in wolf monitoring, but periodic consultation or assistance from USFWS is expected. FWP would monitor the population as described in Alternative 2 (Updated Council).

Other Wildlife. Same as Alternative 2 (Updated Council).

Private Property. Same as Alternative 2 (Updated Council). Federal laws guide response to wolf conflicts on private property. No government restrictions on private property uses.

Hybrids. Same as Alternative 2 (Updated Council).

Wildlife Management Areas. Same as Alternative 2 (Updated Council).

Table 29. The spectrum of potential management activities to minimize the potential for wolf-livestock conflicts and the management tools available to resolve conflicts where and when they develop. The State of Montana intends to find or create an entity to administer a compensation program. The adaptive management model calls for a more conservative approach for public lands and when there are 10-15 breeding pairs (according to the federal recovery definition of an adult male and female with two pups on Dec. 31). More liberal tools become available if there are greater than 15 breeding pairs in Montana. Some management strategies may apply across all numbers of breeding pairs or landownership, as indicated by the arrows.

	10-15 Breeding Pairs* ← | → **Greater than 15 Breeding Pairs***			
	Public Lands	**Private Lands**	**Public Lands**	**Private Lands**
Livestock Producers	Non-injurious, opportunistic harassment ok; report in 7 days →	→	→	→
	Intentional injurious harassment by permit only if wolf activity in vicinity of livestock persistent →	→	→	→
	WS response; technical assistance from WS & FWP →	→	→	→
	No lethal take in defense of livestock or herding animals without a permit	Injure or kill wolf in the act of biting, wounding, or killing livestock or dogs; physical evidence must be confirmed; report within 24 hours	No lethal take in defense of livestock or herding animals without a permit	Injure or kill wolf in the act of biting, wounding, or killing livestock or dogs; physical evidence must be confirmed; report within 24 hours
	Kill permits available after livestock confirmed wounded or killed and agency efforts to resolve the problem were completed, but ineffective; physical evidence must be confirmed; report within 24 hours	Kill permits available if there at least two confirmed depredation incidents on the property or adjacent property (could be separated by a reasonable amount of time) … AND… wolves routinely present and pose a risk to livestock or dogs; report take within 24 hours	Kill permits available after livestock confirmed wounded or killed and agency efforts to resolve the problem were completed, but ineffective; physical evidence must be confirmed; report within 24 hours	Kill permits available if there at least two confirmed depredation incidents on the property or adjacent property (could be separated by a reasonable amount of time) … AND… wolves routinely present and pose a risk to livestock or dogs; report take within 24 hours
	Conservative number issued	Conservative number issued	Number issued more liberal	Number issued more liberal

Table 29. Continued.

	10-15 Breeding Pairs* ←		→ Greater than 15 Breeding Pairs*	
	Public Lands	**Private Lands**	**Public Lands**	**Private Lands**
Citizens (outfitters, hunters, recreationists)	Same as livestock producers	→	→	→
Wildlife Services	Technical assistance to producers, cooperation with FWP	→	→	→
	Activity directed by MOU with FWP and Montana Department of Livestock	→	→	→
	Incremental approach, conservative	→	Incremental approach	Incremental approach, liberal
Montana Fish, Wildlife & Parks	Technical assistance to producers, cooperation with WS	→	→	→
	Special permit administration and oversight; carcass retrieval	→	→	→
	Responsible for disposition of wolves involved in conflicts	→	→	→
	Public outreach to inform and address specific needs	→	→	→
Compensation	State of Montana intends to find or create an independent entity to administer a compensation program; details developed pending final results of Compensation Research Study; Non-governmental organization administers	→	→	→

Table 29. Continued.

	10-15 Breeding Pairs* ←		→ Greater than 15 Breeding Pairs*	
	Public Lands	**Private Lands**	**Public Lands**	**Private Lands**
Compensation	Private donations and or special state or federal appropriations (no FWP, matching federal or general state funds)	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. For the purposes of adaptive management, Montana will apply the federal breeding pair definition (a male and a female and at least two pups on December 31) since not all packs successfully breed and have pups every year. Montana would need to maintain 14-18 social groups (defined as four or more wolves traveling in winter) statewide to reliably attain a minimum number of 10 breeding pairs with at least two pups on December 31.

Table 30. Summary of how each alternative addresses the issues identified by the Montana Wolf Management Advisory Council and by the general public in spring, 2002.

Issues	Alternative 1 No Action	Alternative 2 Updated Council	Alternative 3 Additional Wolf	Alternative 4 Minimum Wolf	Alternative 5 Contingency
Wolf Management **Numbers** **Distribution**	Existing program; emphasizes species recovery and resolution of conflicts with livestock and protection of human safety; pack definition is the same as a breeding pair -- "a male and a female with at least 2 pups on December 31"; little emphasis on proactive management of numbers and distribution outside context of conflict resolution	Adaptive; management like other large carnivores; trigger is 15 breeding pairs; no cap; no zone; regulated harvest possible in the future; packs managed according to provisions of the Planning Document and the 2003 updates when within Montana state boundaries and in with coordination the adjacent authority; Montana will count packs that den within the state border towards adaptive management tally; all boundary packs are counted toward tri-state recovery requirement, but shall not be counted by more than one state	Same as Alternative 2; adaptive management trigger increased to 20 breeding pairs according to the federal recovery definition	Not adaptive; cap at minimum number of breeding pairs and social groups above delisting level; zoned out of eastern Montana and off private property; packs defined according to the federal definition of breeding pair; boundary packs managed conservatively; more management and control carried out by landowners	Same as Alternative 2; no regulated harvest; federal rules and regulations guide harassment and take
Social Factors	Conservative management, as per ESA; protectionist	Moderate; balanced; integrated into wildlife program; program goal is "biologically possible, socially acceptable, and economically feasible"	Same as Alternative 2	Aggressive management; low tolerance; treated separately as a "cost"; not integrated into wildlife program; exploitative	Same as Alternative 2, but responds to public concerns over potential delisting delays by implementing the Alternative 2 as an interim step (to the extent allowed by federal law) prior to gaining full authority

Table 30. Continued.

Issues	Alternative 1 No Action	Alternative 2 Updated Council	Alternative 3 Additional Wolf	Alternative 4 Minimum Wolf	Alternative 5 Contingency
Administration **Delisting**	USFWS, WS; listed under ESA; federal laws apply	FWP, FWP Commission, MDOL, WS; no longer listed as endangered/threatened under federal law or endangered under state law; state laws, administrative rules apply	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2, but wolf still listed under state and federal law; some federal laws and regulations apply
Prey Populations	Wolf impacts to big game populations not addressed without an approved state plan; since no state plan would be prepared, no management could occur to address prey concerns; monitoring and research at current levels	wolf/prey management integrated, ecological; increase monitoring where wolf packs establish; research; increase/decrease hunter opportunity for predators and prey currently and as appropriate to meet goals	Same as Alternative 2	Aggressive wolf management to benefit prey; no enhanced ungulate monitoring	Same as Alternative 2 but wolf management tools limited to relocation
Funding	Federal	Combination of federal, state, private sources; federal share required for implementation	Same as Alternative 2	Federal	Federal 90%, state 10%; state's share is license revenue and private
Livestock	Existing rules/regulations (experimental area rules and pending reclassification proposal)	WS MOU with FWP; FWP special kill permits for landowners; defense of life/property if wolf is "attacking, killing, or threatening to kill"	Same as Alternative 2; greater emphasis and more resources dedicated to preventative measures and proactive approaches to minimize risk	WS liberal, landowner special kill permits liberal	Same as Alternative 2, federal law and regulations guide owner harassment or take of wolves with or without a permit, on public or private lands
Wolf Habitat, Connectivity, Land Management	Provided by legal protections, achieving adequate population numbers; public education	Same as Alternative 1; FWP technical participation and coordination with land management agencies and transportation planners	Same as Alternative 2	Same as Alternative 2; connectivity through periodic trap/relocation	Same as Alternative 2

Table 30. Continued.

Issues	Alternative 1 No Action	Alternative 2 Updated Council	Alternative 3 Additional Wolf	Alternative 4 Minimum Wolf	Alternative 5 Contingency
Compensation	Voluntarily provided by Defenders of Wildlife as long as wolf still listed under ESA	Yes; State of Montana intends to find or create an entity to administer a compensation program; no FWP funds (state or matching federal monies) and no Montana general fund monies; may still be voluntarily provided by Defenders of Wildlife or	No; State of Montana would not find or create an entity to administer a compensation program; may be available voluntarily by Defenders of Wildlife	No; wolf management aggressive by landowners, WS, and FWP to minimize livestock losses	Same as Alternative 2
Economics, Livelihoods	Avoid disrupting land management activities that may be harmful to local economies and livelihoods; resolve wolf-livestock conflicts; compensation for livestock losses made by independent entity; wolf recovery benefits other economic sectors and commercial activity	Economic costs and benefits of wolf restoration in Montana accrue to individuals or economic sectors differently; integrate and sustain a wolf population within the complex biological, social, and economic landscape; acknowledge the benefits to other economic sectors associated with recovered population; compensation for confirmed and probable livestock losses; provisions to minimize wolf effects on ungulate populations through integrated management	Same as Alternative 2, but FWP would more proactively address and minimize risk of economic losses for livestock producers and private landowners to the extent possible	Aggressive and liberal management to favor the economic interests of livestock producers and others who may be economically impacted by higher wolf numbers; does not capture full economic benefits associated with tourism	Same as Alternative 2, but federal regulations guide resolution of wolf-livestock conflicts
Information, Education, Public Outreach	Existing effort	Increased effort through Conservation Education Division; technical assistance to landowners	Same as Alternative 2	Limited effort by Conservation Education Division; high degree of interaction with landowners to notify when wolves in the area	Same as Alternative 2

Table 30. Continued.

Issues	Alternative 1 No Action	Alternative 2 Updated Council	Alternative 3 Additional Wolf	Alternative 4 Minimum Wolf	Alternative 5 Contingency
Human Safety	Lethal take to defend human life if immediate threat to person and by agencies to protect human safety; citizen must report incident in 24 hours	Discourage habituation; FWP removes habituated animals; lethal take to defend human life if imminent danger; citizen must report in 72 hours; FWP or agent may take wolf to protect human safety in proactive context	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2, but reporting requirement is 24 hours according to federal regulations
Monitoring	Done by USFWS to document progress towards recovery goals	Yes; effort commensurate with other wildlife using standard protocols; balance cost effectiveness with precision; document breeding pairs for adaptive management framework; validate more general definition of at least four wolves traveling in winter	Same as Alternative 2	Yes; intense telemetry effort required	Same as Alternative 2
Other Wildlife	No special provisions; FWP responds to special needs where/when they develop; ecosystem processes; impacts to other listed species not significant	Taken into account by integrating wolf within wildlife program; ecological context so some species benefit but others may not; FWP responds to special needs where/when they develop	Same as Alternative 2	May benefit because of low wolf numbers; scavengers benefit less	Same as Alternative 2

Table 30. Continued.

Issues	Alternative 1 No Action	Alternative 2 Updated Council	Alternative 3 Additional Wolf	Alternative 4 Minimum Wolf	Alternative 5 Contingency
Private Property	Wolves may be present on private property similar to other publicly-owned wildlife; landowner response to wolf use guided by federal laws and regulations; no federally-imposed takings or restrictions on private property	Wolves may be present on private property similar to other publicly-owned wildlife; landowner response to wolf use guided by state laws and regulations; minimize potential for conflicts to the extent possible; resolve conflicts in a timely manner; owners able to grant or deny access to their property; no government-imposed restrictions	Same as Alternative 2	Wolves may be present, but there is greater deference to owners' preferences; landowners granted greater latitude to resolve conflicts and may discourage wolf use	Same as Alternative 2; federal laws and regulations guide response to wolf conflicts in context of livestock as private property; no government restrictions
Hybrids	Do not contribute to wild population; management removal possible; state laws for possession, marking, and, liability; local authorities respond	FWP/state response like USFWS response in Alternative 1	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Wildlife Management Areas	Wolf use possible; limited input from FWP	Wolf use possible; FWP balances wolf and prey use; wolf-livestock conflicts resolved as per *Livestock / Compensation* section	Same as Alternative 2	Limited tolerance for wolf use, discouraged	Same as Alternative 2; federal laws and regulations guide response to conflicts with livestock

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter compares the predicted environmental consequences for each of the five alternatives. Wolves will be present in Montana regardless of which of the five alternatives is selected, but the number of wolves present will vary by alternative. Different management philosophies and tools will lead to different outcomes, each based on the range of management philosophies – from conservative to aggressive.

The environmental consequences are speculative because no one can accurately predict the status of Montana's wolf population at the time of actual delisting, which may be one to three years away. Moreover, the actual outcomes will result from future management decisions and circumstances that may or may not have been fully anticipated. Therefore, the reader may find it helpful to consider the significance of the impacts described in each alternative, and then to compare alternatives relative to each other rather than to focus exclusively on the prediction. The impacts are estimated using the best available information and historical data, in keeping with accepted scientific and statistical methods. Some assumptions were necessary to estimate impacts. Those assumptions will be identified wherever they occur.

For this EIS, FWP evaluated the environmental consequences by assuming each alternative would be implemented starting in 2003. Impacts are then reported for 2015. Some environmental consequences will be short term and develop rapidly. Others may not emerge for several years. The longer time span accounted for: 1) the time required to complete the delisting process, 2) the biological life span of wolves and their prey, and 3) impacts which develop while the wolf population stabilizes. Cumulative environmental impacts result from incremental consequences added to other past, present, and reasonably foreseeable actions by FWP, including actions by other state agencies and businesses regulated by other state agencies. In this EIS, consideration of cumulative impacts is limited to the State of Montana.

While impacts are predicted, it is also possible for FWP to mitigate or lessen impacts to some degree, based on how and when specific management strategies described for each alternative are implemented. FWP intends to lessen the impacts of a recovered wolf population where possible, while still maintaining a secure and healthy population. This chapter also identifies any irreversible and irretrievable commitments of resources to implement any of the five alternatives. A summary of the consequences of each alternative is presented at the end of this chapter (Table 43).

Methods to Estimate Some of the Environmental Consequences

None of the alternatives in the EIS represent the type of policy choices examined in the analysis conducted prior to the reintroduction of gray wolves to YNP and central Idaho. Rather than a "wolves or no-wolves" analysis, this EIS analyzes the consequences of a spectrum of wolf conservation and management alternatives. This section describes the methods used to estimate certain consequences. Other methods are described under each alternative.

Wolf Numbers and Distribution

Wolf numbers and distribution are expected to increase through time. FWP is uncertain of how rapidly the wolf population will grow. Some newly colonizing wolf populations in highly productive habitat, such as YNP, have grown rapidly. Other long-established populations, such as in northwestern Montana have increased more slowly. Wolf distribution will probably be determined by prey abundance and

Montana geography that presents intermingled valleys and mountainous terrain, and a patchwork of human settlement, variable wild prey densities, and livestock distribution. Future wolf population growth in Montana will probably be determined by social conflicts between wolves and humans. At present, there is no reliable method to determine "social tolerance." How fast the population grows and where wolves will be found will differ across the five alternatives that reflect a spectrum of social tolerance and management approaches. Therefore, the total number of wolves was predicted differently for each alternative. Once the total number was predicted, the number of breeding pairs is also predicted using the mathematical relationships that describe the correlation between the minimum number of wolves in the fall population and the number of breeding pairs for the gray wolf population in the State of Montana, based on historical data (USFWS unpubl. data).

For Alternative 1 (No Action), the gray wolf stays listed and managed according to the original recovery plan and the Yellowstone EIS (USFWS 1994a). The number of wolves in the experimental population area was predicted by assuming the population would grow at 22% per year – the same growth rate assumed for the Yellowstone EIS. The number of wolves in the Northwestern Montana Recovery Area in 2015 was predicted using population performance between 1986 and 2001. The number of wolves in each area was added together to predict the total number of wolves in the Montana population.

For Alternatives 2 (Updated Council) and 3 (Additional Wolf), wolf numbers were estimated by analyzing historical data for the Montana portion of the tri-state population from 1986-2001 (USFWS unpubl.) Historical finite rates of growth (lambda) were assumed to be representative of future population performance and applied to the predicted Montana wolf population at the time of delisting in 2003. Implementation of liberal management tools was assumed to decrease the population growth rate by 50%. The decreased growth rate was applied to the population from the year liberal tools are implemented until 2015.

Owing to the uncertainty about how fast the wolf population will actually increase, FWP estimated the size of a future wolf population according to a low growth rate and a high growth rate. The low growth rate is derived from actual historical data. The high growth rate was assumed to be double the low growth rate. FWP expects the number to actually be near the low end of the range. The Montana wolf population may stabilize at numbers at or near the adaptive management trigger so that liberal tools may not be available every year between 2003 and 2015. The population could still increase or decrease from year to year.

For Alternative 4 (Minimum Wolf), wolf numbers are capped near the recovery goals. Aggressive management and control is assumed to limit the population at or near the cap.

For Alternative 5 (Contingency), wolf numbers were predicted using the same method as Alternatives 2 and 3. However, FWP could only implement some of the liberal management tools because of certain restrictions imposed by federal regulations. Therefore, the population growth rate was reduced by only 25% (rather than 50%) between the time that liberal management tools are implemented and 2015. The wolf population may stabilize at numbers at or near the adaptive management trigger so that liberal tools may not be available every year between 2003 and 2015. The population could still increase or decrease from year to year.

Prey Populations and Hunter Opportunity

The gray wolf is an effective predator of ungulates. The impact on ungulate population dynamics can usually be gauged in relation to other environmental factors, such as weather, and what other species are present in the system. For example, wolf predation may accelerate declines in ungulate populations already negatively affected by severe winters and even slow the rate of population recovery afterwards –

especially if there is more than one large predator. During a series of mild winters, wolf predation may not significantly influence ungulate populations.

All prey populations vary through time, across a diversity of habitats, and in response to ever changing environmental factors. The cause and effect relationships that make populations go up or down are often not known, yet widely debated. FWP's ungulate management program is designed to provide an opportunity for regulated harvest, while balancing population status, other mortality factors, habitat condition, landowner tolerance, hunter opportunity, previous hunter success, and an array of environmental factors known to influence populations. In general, Montana big game populations are robust and hunters enjoy greater opportunity now than even 20 years ago (see Chapter 2). Statewide harvest trends reflect that. At the regional level, similar trends are apparent, but more variable. At the hunting district level, harvest sometimes varies even more--and so do the factors influencing hunter success.

Changes in ungulate population dynamics or hunter participation may or may not be directly influenced by wolf presence. For example, in one northwestern Montana hunting district having established wolf packs since the mid-1980s, the number of elk hunters declined by 22% and the number of elk hunter days declined by 15% between the late 1980s and the mid-1990s. Declines in white-tailed deer and elk populations were attributed to additive predation pressures by wild carnivores (wolf, black and grizzly bear, coyote, mountain lion) and human hunting during those same years (Kunkel and Pletscher 1999). In a district to the south with similar habitat and snow regimes, the number of elk hunters and elk hunter days also declined, but in the absence of resident wolf packs. But in adjacent districts to the west having resident wolf packs at a lower density, the number of elk hunters and elk hunter days did not decline during that time. FWP does not fully understand why hunter effort changes at the hunting district level, but perceived or real changes in prey abundance due to a variety of factors may influence the decisions of individual hunters. Hunters may also be influenced by changes in hunting regulations for harvesting particular age or sex classes of big game.

This EIS must assess each alternative's potential impact on prey populations and hunter opportunity due to all factors, including the presence of a recovered wolf population. FWP relies on the combination of biological information, results from the telephone harvest survey, changes in the environmental, weather events, and time to interpret ungulate population trends. Ultimately, all sources of data must be taken together to respond to changes in the population status of either wolves or their prey. This EIS considers future changes in ungulate populations due to implementation of each of the five alternatives in relation to historical trends at the statewide level.

Economics

Four specific areas of economic impacts were addressed: 1) wolf depredation on livestock, 2) big game hunting (primarily elk, deer, and moose) and the big game outfitting industry, 3) recreational values, and 4) the fiscal resources of FWP. Historical data were used to calculate some economic impacts. Other economic impacts are less clear due to future uncertainty and to the variation in historical data. Impacts to recreational and social values are also difficult to determine.

Because all the alternatives maintain a recovered wolf population in Montana, the estimated socioeconomic impacts across the five alternatives are similar. In fact, those impacts which can be calculated and estimated with some reliability and that do vary with each alternative, are limited to livestock losses and agency management costs. The lack of differences in impacts across the spectrum of alternatives does not mean that the alternatives have equal impacts. Rather, it is an acknowledgement that in light of all the potential ways that wolves, prey, the environment, human hunting, and recreation

interact, it is difficult to identify the impact associated with incremental differences in wolf numbers statewide.

Livestock Losses. Livestock losses were predicted using historical data for the Montana portion of the tri-state area from 1986-2001 (WS and USFWS unpubl.). As the wolf population in Montana increased during those 15 years, the number of confirmed livestock losses generally increased as well, although losses varied from year to year. FWP expects that general trend to continue as wolf numbers and distribution increase.

To predict confirmed wolf-caused livestock losses, FWP tallied the number of cattle and sheep killed for every wolf in the population each year between 1986 and 2001 and then calculated a depredation rate for each year (number confirmed livestock kills divided by total number of wolves). The annual rates were averaged over all years to account for the variation year to year. Predicted loss in 2015 is the rate multiplied by the predicted number of wolves under each alternative. Because each alternative calls for different management philosophies and specific tools to resolve wolf-livestock conflicts, the loss rate was adjusted to account for implementation of those tools, as described below.

FWP recognizes that wolves have also been the suspected cause of some livestock losses in the past because WS could not confirm a wolf as being responsible. FWP expects this will occur in the future. Therefore, FWP examined the report forms completed by WS personnel upon investigation of a wolf complaint for the calendar years 1999-2001 to discern whether wolves could have possibly been involved. Cattle and sheep losses that were not attributed to some other obvious cause, such as disease, lightening, or accidental death were tallied as "probable" wolf-caused losses. FWP then calculated the rate of probable cattle and sheep losses. The probable loss rate multiplied by the predicted number of wolves under each alternative equals the total probable losses in 2015.

FWP also acknowledges that wolves have killed or injured other domestic animals such as guarding dogs, llamas, or horses. While these losses have been intermittent and are more difficult to predict based on wolf numbers, nonetheless, they do represent economic losses to the owner. To account for these other domestic animal losses, the Defenders of Wildlife compensation records were examined. Historically, payments for other domestic animals were about 8% of the total payments for confirmed and probable cattle and sheep losses. The economic losses for other domestic animals are estimated for each alternative by taking 8% of the predicted economic losses for cattle and sheep.

FWP is also aware that livestock producers may experience losses for which little or no physical evidence is ever found. These are referred to as undocumented losses, and they tend to be associated with remote public land grazing allotments rather than private property. This EIS does not account for undocumented losses because reliable data for Montana were not available.

Under Alternative 1, confirmed and probable livestock losses were estimated using historical data. Management protocols essentially call for a reactive approach to livestock depredation, except for a few specific circumstances.

Under Alternatives 2 (Updated Council) and 3 (Additional Wolf), implementation of liberal management tools is assumed to reduce the historic livestock depredation rate by 50% and in direct proportion to the 50% reduction in the growth rate of the wolf population. Nearly all depredations in Montana to date were on private lands. The management protocols of these alternatives should reduce the number of wolf-livestock conflicts in general, but most specifically on private lands.

Under Alternative 4 (Minimum Wolf), management strategies call for limiting the wolf population at or near Montana's share of the recovery goal. Aggressive management is assumed to reduce the historic livestock depredation rate by 75%.

Under Alternative 5 (Contingency), FWP could only implement some of the liberal management tools because the gray wolf would still be listed. Those tools are assumed to reduce livestock depredation rates by 25% and in direct proportion to the 25% reduction in the growth rate of the wolf population.

Big Game Hunting. There is a link between big game populations, the number of hunters and hunter days, and the overall levels of hunter expenditures in the state. However, the relationship between a recovered wolf population, big game populations, and Montana's economy is not clear-cut. Many things influence hunter participation, including general economic conditions, weather, demographic changes, and changes in hunting regulations. For example, between 1996 and 2000, the number of Montana residents purchasing elk hunting licenses declined by 21%, at a time when big game populations were generally increasing.

Hunter numbers, hunter days, and antlerless opportunity have changed in FWP regions and individual hunting districts where wolves were present and where wolves were not present. So far, the presence of wolves appears to play a relatively minor role among the many factors that affect big game populations, hunting activity, and the economy. It is difficult to isolate potential wolf impacts from the other factors. This is particularly true at the statewide level where differences between hunting districts or regions can be balanced by hunters shifting to other areas with better opportunity.

Therefore, across all alternatives, the economic impacts to big game hunting were estimated based on the actual observed changes year-to-year in deer, elk, and moose hunting activity from 1990-2001 (as measured by the long term average, +/- 1 standard deviation). FWP assumes that changes in the number of hunters, hunter days, and antlerless permits in the future would be no greater than changes already seen in the past. This period includes several major events, including, high hunter harvest years (e.g. 1991), the severe winter of 1996-97, summer forest fires, major programmatic changes in mule deer management, wolf pack activity in new areas, as well as significant increases in hunter opportunity for antlerless elk in some areas. Even though wolves were present in Montana from 1990-2001, changes in permits and hunter participation were driven by a host of factors including wolf predation, changes in recruitment, overwinter survival, hunter opportunity, hunter demographics, previous hunter success, changes in regulations, and hunter access. This combination of factors will persist into the future.

The economic analyses focus on changes in antlerless harvest opportunity for deer and elk and in the number of hunting permits for all moose. These are the primary management tools used by FWP to annually balance hunting pressure with ungulate population levels and to influence population trends relative to management objectives.

Alternative 1. No Action

Because the outcome of the pending changes in federal regulations were not known at the time of printing, the environmental consequences of this alternative were predicted as if the current federal management policies and regulations were carried forward from 2003 to 2015. For comparison, the environmental consequences of this and the other alternatives are presented in a summary at the end of this chapter (Table 43).

Biological Environment

Wolf Management. Wolf management is oriented toward achieving recovery goals and resolving conflicts when and where they occur. Wolves in northwestern Montana would still be managed as "endangered." Wolves in the rest of the state would be managed as "experimental, non-essential" which allows greater management flexibility. Thus, differing agency regulations would be implemented in different parts of the state. Management policies do not allow USFWS to proactively adjust wolf numbers or distribution except where there are human safety concerns or conflicts with livestock. Instead, conflicts are usually addressed and resolved after the fact. More conflicts may occur in the future because of higher wolf numbers and wider distribution in Montana. Wolves can be harassed or killed through agency control actions and by private landowners through a special permit in the experimental area. Wolves can be harassed or killed only through agency control actions in northwestern Montana.

Wolf Numbers and Distribution. Approximately 854 wolves (or about 70 breeding pairs according to the federal recovery definition) would be present in Montana in 2015. The population will fluctuate because of management actions, changes in prey density and prey distribution, disease, and intraspecific competition. It is possible that Montanans' social tolerance for wolves could lead to USFWS control actions that stabilize the population at a lower level or that the population will grow more slowly than predicted. The number of wolves in the tri-state area would also increase.

Wolf distribution will probably increase as individual wolves disperse from core areas and colonize new habitats with sufficient prey. In the absence of significant conflict, gray wolves could become established in island mountain ranges, such as the Big and Little Snowies or even in eastern Montana. Wolves would be allowed on FWP WMAs. This is consistent with existing FWP policies that these lands were purchased to benefit all wildlife but that they are managed with particular attention to wintering big game. These areas will probably always attract wolves because of the seasonally high densities of prey. In the absence of a state wolf plan, concerns about localized impacts could not be addressed.

Wolf Habitat, Connectivity, and Land Management. Connectivity requirements are met because the wolf population should provide an adequate number of dispersers that emigrate to Idaho, Canada, or Wyoming. Furthermore, wolves coming to Montana from these other areas should have a greater chance to join an existing pack or locate other dispersers to start a new pack. Public land management activities, whether logging, grazing, or travel management are not affected by this alternative. Exceptions could be made for localized area closures around dens, particularly within national parks. Land managers would change practices of their own accord at any time to meet other management objectives.

Monitoring. USFWS's monitoring efforts tabulate breeding pairs that contribute to the recovery goal, locate new packs, document the reproductive status of packs, and document the home range of packs through telemetry. If the gray wolf stays listed once recovery goals are achieved, monitoring effort may decline after documenting the minimum number of breeding pairs and demonstrating that the population still meets the recovery goals. USFWS may also have less knowledge about pack location, home ranges, or numbers of individuals because more monitoring effort will be required over a greater geographic area. It will also be more difficult to maintain telemetry contact with every pack.

Prey Populations. FWP expects that both species of deer, elk, and moose will constitute the primary prey species for wolves in Montana, but in differing proportions in different parts of the state. Although there may be significant impacts to some populations or herd segments sporadically over time, most big horn sheep and mountain goat populations are not particularly vulnerable to predation by wolves because wolves chase rather than stalk their prey like mountain lions do. The rugged and steep terrain favored by big horn sheep or mountain goats is not conducive to chasing prey over moderate to long distances.

At the regional and statewide scale, prey populations will fluctuate through time due to all causes of mortality (predation, natural mortality, human hunting, habitat conditions, and weather events) similar to the historical patterns described in Chapter 2 (Existing Environment). Across broad geographic areas, wolf predation alone is not expected to influence prey populations in the absence of more significant environmental events. But at a localized level, prey populations may be more influenced by wolf predation, particularly in combination with predation by other large carnivores and/or human hunting. Predation pressure may exaggerate a population decline initiated by unfavorable weather events or even slow population recovery, particularly if human harvest rates of antlerless animals are too high. Localized prey populations may even stabilize at a smaller level. Wolf predation on small ungulate populations, even if infrequent, may be more influential on population trend than for larger ungulate population because predation may remove a greater proportion of animals. In the absence of a state wolf management plan, USFWS would not consider mitigating those impacts to localized big game populations through reductions in pack size. Therefore, FWP may decrease hunter opportunity, particularly for antlerless animals in some hunting districts, since FWP is only able to manage the prey side of the equation. At this time, FWP cannot predict if, when, or how significant those changes might be. It is also possible that hunter opportunity for antlerless animals may increase in the future to meet other management objectives.

Other Wildlife. Some wildlife species would benefit from implementation of this alternative because the gray wolf is an important link in the food chain. In addition, wolf predation tends to remove old, sick, or debilitated animals from the population, although this is not always the case because wolves also kill young and healthy animals. Wolf kills are visited by a wide variety of scavenging species which directly benefit from this food source on a year round basis. The presence of wolves is also thought to enhance ecosystem functioning by changing ungulate habitat use patterns. Other wildlife species may be impacted directly through predation or indirectly through competition for food resources or space. For example, some local mountain lion populations may decline in the general vicinity of wolf pack territories. The magnitude of these positive and negative consequences are difficult to predict, but are expected to occur on a localized level where wolves become established. Nonetheless, FWP would have limited influence to mitigate or enhance impacts to other wildlife because it would not be the lead agency managing the wolf population.

ESA also directs the USFWS wolf program to consult with other USFWS recovery programs to be sure that recovery of one species is not jeopardizing recovery of another. Under this alternative, these internal consultations must continue because the wolf is still listed.

Human Environment

Social Factors. Wolf restoration has been a divisive issue among Montanans. While some Montanans supported recovery, others opposed it. People in northwestern Montana are becoming accustomed to wolves since they have been present going back to the mid 1980s. Elsewhere in Montana, citizens are still adjusting to the presence of a newly introduced population. This alternative would lead to the largest estimated wolf population of the five considered. For those individuals opposed to the presence of wolves in Montana and/or their management by USFWS, this alternative represents the largest negative impact on social and cultural values. Conversely, individuals supportive of wolf presence in higher numbers and conservative management philosophies would receive the greatest positive social benefit.

Because USFWS administers the program, the diverse interests and needs of all Montanans would not necessarily be taken into consideration or addressed in a proactive fashion. Nonetheless, USFWS would take action to alleviate conflicts between wolves and people or livestock where and when they develop.

Public Outreach. Current public outreach efforts may not adequately meet future needs as the wolf population increases and wolves colonize new habitats. The federal wolf program does not have dedicated personnel to fulfill the public's need for information and educational materials. Staff biologists fulfill this need as a part of their other assigned duties. WS may fulfill some of the increasing needs through its technical assistance efforts with livestock producers.

Human Safety. People may encounter wolves more frequently. In the presence of an immediate threat to themselves or another person, people could harass, injure, or kill wolves. USFWS may harass or kill wolves that threaten human safety. Individuals who injure or kill a wolf in the absence of a direct and immediate threat could be subject to federal prosecution. At the present time, people are not able to defend their domestic pet if it is threatened or attacked by a wolf in the experimental area or in the Northwestern Montana Recovery Area. USFWS could change those regulations in the future.

Private Property. USFWS did not need to restrict uses of private land to recover wolves in the northern Rockies. Restrictions on behalf of a biologically recovered population would also be unnecessary. While wolf use is primarily on public lands, some use of private lands does occur. Use of private lands will undoubtedly increase in the future with increasing wolf numbers.

A larger wolf population under this alternative could result in more conflicts and a greater management burden on private property owners, WS, or USFWS to resolve conflicts. If not under immediate voice command, lion hounds or bird hunting dogs may be injured or killed in wolf encounters. The economic impacts of wolf-livestock conflicts are addressed below.

Economics / Livelihoods

Livestock Depredation. Chapter 2 (Existing Environment) provides a detailed discussion of the recent history of confirmed livestock depredation in Montana. In economic terms, the total lost value per year is equal to the estimated number of lost animals per year times the market value of those animals. From 1986-2001, the average number of cattle and sheep killed per wolf per year was 0.154 and 0.1752, respectively. Actual historical livestock losses to wolves may be underestimated due to the difficulty in identifying the exact cause of death. The extent to which the number of confirmed livestock losses underestimates total livestock losses is unknown. To account for this, probable losses were estimated at 0.093 cattle and 0.015 sheep per wolf per year, and these estimates were added to the confirmed loss estimates. Assuming that all probable losses are actually due to wolves probably overstates actual losses. Nonetheless, that assumption was made on account of the uncertainty about what actual losses might be. Wolves also occasionally kill horses, llamas, or guarding dogs. These losses, while sporadic and difficult to predict, do result in economic loss. Therefore, these economic losses are incorporated as a percentage of the total compensation payments based on historical data.

Approximately 132 cattle and 150 sheep per year would be lost to confirmed wolf depredation. Another 79 cattle and 13 sheep could be lost to probable wolf depredation (Table 31). Losses to other predators are greater than the predicted losses due to wolves, but the combined totals may be of concern. From 1990-2000, an average of 21,500 sheep and lambs per year were killed per year by coyotes in Montana (USDA 2002). In 1995, approximately 1,100 calves were killed by coyotes (USDA 2002). In YNP, the coyote population was reduced by 50% in areas where wolves established territories (Crabtree and Sheldon 1999). Outside YNP, it is not known to what extent wolves will reduce coyote populations under the wolf densities projected by the various alternatives. It is possible that wolves could displace coyotes in some areas grazed by sheep and that coyote predation on sheep may decline. However, it is not clear whether wolves will be tolerated in sheep ranching areas.

The average value of all cattle in Montana was $850 per head, and the average value of all sheep was $94 per head as of January 1, 2001 (Montana Agricultural Statistics Service 2002). Purebred lines may, in fact, have a significantly higher value, while other animals may have a significantly lower value than this average. While value per animal has declined recently, over the last 10 years it has remained relatively stable in real dollar terms. These values are projected to remain stable in real dollar terms (corrected for inflation) out to 2015. These values are similar, but differ slightly from actual payments from the Defender's of Wildlife Compensation Fund because the latter are individually negotiated.

FWP predicts that in 2015, gray wolves in Montana would be responsible for about $210,499 in total livestock depredation losses per year (confirmed, probable, and other) (Table 31). The total costs associated with wolf depredation losses are likely to be smaller during the early years of implementation due to a smaller wolf population. Other expenses of livestock industry include increased management costs due to changes in husbandry practices or materials associated with improving the physical security of animals such as night pens or electric fencing. These costs are difficult to estimate and have not been quantified. Presumably ranchers already incur some management costs to mitigate for predator losses.

The estimated annual livestock depredation losses for this alternative are small compared to either the statewide value of annual sheep and cattle production or to the level of annual livestock losses to predators other than wolves and to natural causes. But wolf losses are not spread evenly among all Montana livestock producers or shared by the industry as a whole. These losses are borne by individual livestock producers and in fact, the losses may be significant in proportion to the size of the operation. Additionally, these losses represent new, added risk to some livestock producers because of where they are located geographically with respect to wolf distribution.

Under this alternative, livestock producers have some assurance that Defenders of Wildlife will continue to pay for confirmed losses since the gray wolf stays listed. However, this program is provided voluntarily and is sustained through private donations. It could be discontinued at any time. If Defenders of Wildlife were to cover the predicted confirmed cattle and sheep losses in 2015, the cost would be about $126,300. Other economic costs, such as probable losses or expenses from enhanced husbandry, would still be borne by the individual livestock producer.

This alternative predicts some of the highest future cattle and sheep losses of any alternative. There may be more wolf-livestock conflicts in the absence of a proactive management program which fine-tunes wolf numbers and distribution. Individual livestock producers and USFWS will incur higher direct and indirect management costs to avoid and resolve wolf-livestock conflicts. This alternative could also foster the expectation that there should be radio collars present in every pack so they can be easily found. Under this alternative, landowners could have a greater risk of losses in the absence of changes on their part as wolves increase in number and distribution.

Big Game Hunting. At the statewide level, wolf management under this alternative is not expected to cause significant changes in hunting activity beyond the increases and decreases observed since 1990. Greater changes at the local hunting district level are more likely, but will probably be caused by a suite of factors that includes the presence of wolves. FWP cannot predict the magnitude of local impacts. Table 32 shows the historical variability in elk, deer, and moose hunting participation from 1990-2001 at the statewide level. Changes between 2003 and 2015 should not exceed what is shown. Note that hunter participation could also increase because of changes in regulations to increase harvest, thereby reducing populations to accomplish other management goals.

Table 31. Estimated livestock losses (confirmed and probable) and the economic value of livestock and domestic animal losses in the year 2015 for Alternative 1 (No Action).

Type of Loss	Number of Animals Lost	Value per Head[a]	Total Value of Loss
Confirmed Cattle	132	$850	$112,200
Confirmed Sheep	150	$94	$14,100
		Confirmed Total Value	$126,300
Probable Cattle	79	$850	$67,150
Probable Sheep	13	$94	$1,222
		Probable Total Value	$68,372
		Total cattle and sheep losses	$194,672
		Estimated Loss of Other Domestic Animals[b]	$15,827
		TOTAL ESTIMATED ANNUAL LOSS	$210,499

[a] Average value of all sheep and lambs and all cattle, 2001 Montana Agricultural Statistics.
[b] Historically, Defenders of Wildlife compensation payments for other domestic animals (guarding dogs, horses, or llamas) was 8.13% of the total payments for cattle and sheep.

Regional Economic Activity. From a statewide perspective, economic theory suggests that nonresident hunter expenditures impact the Montana economy by bringing additional dollar expenditures into the state. Increasing or decreasing levels of resident hunting and hunting-related expenditures will not impact the overall state economy. This is because as residents, these hunters will likely spend the money they did not spend hunting in some other sector of Montana's economy. In other words, changes in hunter opportunity and participation are not anticipated to affect the proportion of income that consumers statewide spend on average for all goods and services combined.

While changes in resident hunter spending patterns within Montana will not substantially impact total statewide economic activity, these changes may impact certain geographic areas and businesses. For example, if big game populations in a popular area were to decline due to wolf predation or some other cause, resident hunters might shift their effort to other areas. This shift could negatively impact the local economy in the area experiencing the loss of hunters and positively impact the areas gaining hunters. While the statewide net impact could be near zero, there could be changes in local communities. Given the current uncertainty about the degree, scale, or areas in which wolf restoration has significantly impacted big game populations and hunter effort to date, it is difficult to estimate the likelihood or extent of these types of regional impacts.

Each year, nonresidents spend significant amounts of time and money hunting big game within the state (Chapter 2). The state's economy could be impacted by a reduction in nonresident hunting if management led to a decline in nonresident hunter opportunity. However, nonresident hunter opportunity is almost entirely driven by policy decisions rather than environmental factors. For example, nonresident elk licenses are capped at 17,000. Due to significant excess demand by nonresidents for elk hunting in Montana, the maximum number of nonresident licenses has been sold since at least 1990. State policy also guides the number of deer licenses, antlerless elk permits and moose permits available to nonresidents. FWP does not anticipate reducing nonresident big game hunting opportunity under this alternative.

Table 32. Range of potential change in the number of hunters, hunter days, and opportunity for deer, elk, and moose between 2003 and 2015 based on the historic range of variation (+/- 1 standard deviation from the long term average 1990-2001).

Species	Statewide Number of Hunters	Statewide Hunter Days	Hunter Opportunity
Elk	+/- 4,066	+/- 47,236	+/- 4,274 (number of antlerless permits)
Deer	+/- 16,798	+/- 102,164	+/- 8,333 (antlerless harvest)[a]
Moose	+/- 46	+/- 781	+/- 56 (total number of permits)

[a] Hunter opportunity for deer is reported as total antlerless harvest because hunters can harvest antlerless deer several different ways: the general deer license, a deer B license, and an over the counter permit.

The number of big game, deer, and deer B licenses available to nonresidents from 1990 to 2000 in shown in Table 33. The slight changes are primarily due to a policy decision to use market prices to achieve a given target number of licenses sold in some license categories. Most of the changes through time occur in the outfitter-sponsored category. Depending on year-to-year changes in the interaction between price and hunter response, nonresident prices are set at levels so that the target number of licenses will be sold on average over a five year period. In some years, the target will be exceeded, but sales will fall short in other years if the price is set too high.

Outfitting Industry. Nonresident hunter expenditures and opportunity to hunt big game are not expected to change under this alternative because nonresident licensing opportunities are established by policy and/or pricing. This implies that there will be no impacts to the outfitting industry on a statewide basis because the primary clientele seeking those services are nonresident hunters (Chapter 2). However, individual big game outfitters could be negatively impacted if a specific ungulate herd segment within their allowable hunting area were displaced due to wolf presence or the local herd was disproportionately reduced by wolf predation or a combination of wolf predation and other environmental factors. Hunter success rates are an important marketing tool and some outfitters may experience declines in nonresident bookings. Data to analyze the potential impacts to specific outfitters are currently lacking. The extent or likelihood of such an area-specific impact is unknown.

Recreational Values

Hunting Values. Wolves have the potential to affect several kinds of recreation in Montana including hunting and tourism. The economic values that an individual places on these recreational experiences, beyond any amount they actually spend, have been estimated on a per trip or per day basis in a number of studies (Chapter 2).

The estimated net economic value for elk hunting is $109 per day (in 2002 dollars), $74 for deer hunting, and $242 for moose hunting (King and Brooks 2001, Duffield and Neher 1990, and Brooks 1996, respectively). Given the variation in the number of hunter days for elk, deer, and moose hunting observed from 1990-2001, total net economic value of big game hunting would also vary year to year. Total net economic values of hunting would be expected to mirror how hunting participation changes in light of the wolf management program described by this alternative and the other factors influencing hunter behavior.

In recent years, some evidence indicates that net economic values per trip for hunting have increased in real terms (King and Brooks 2001). However, there is not enough evidence to reliably predict this trend out to 2015. Therefore, the net economic values per day (or per trip) presented in Chapter 2 are assumed to be constant in real terms (corrected for inflation) over the foreseeable future.

Table 33. Number of licenses sold to nonresidents (NR) for a variety of deer and elk hunting opportunities, 1990-2000.

Year	NR-Big Game Combo General	NR-Big Game Combo Outfitter	Total NR Big Game Combo	NR- Deer Combo General	NR-Deer Combo Outfitter	NR-Deer Combo Landowner	NR-Deer Combo Total	NR-Deer B Licenses
1990	11424	5576	17000	2000	2000	2000	6000	--
1991	11400	5600	17000	2000	2000	2000	6000	--
1992	11400	5600	17000	2000	2000	2000	6000	--
1993	11400	5600	17000	2000	2000	2000	6000	--
1994	11400	5600	17000	2000	2000	2000	6000	--
1995	11400	5600	17000	2000	2000	2000	6000	--
1996	11500	5500	17000	2300	3114	2000	7414	14002
1997	11500	5500	17000	2300	2395	2000	6695	11737
1998	11500	5500	17000	2300	1994	2000	6294	8780
1999	11500	5500	17000	2300	2143	2000	6443	5320
2000	11500	6229	17729	2300	2304	2000	6604	6243

Source: Montana Department of Fish, Wildlife and Parks License Sale Comparison Records.

Wildlife Viewing and Recreational Trip Values. Wolves are charismatic and garner the public's interest nationwide. Many people value the opportunity to see or hear wolves, or simply to recreate in areas where wolves are present (Duffield 1992, Duffield et al. 2001). The reintroduction of wolves to YNP demonstrated the potential for strong links between visitor experiences, visitor spending, and the presence of wolves in an ecosystem. Since the 1995 reintroduction, a significant amount of recreational and economic activity has developed specifically around viewing and listening to wolves within the park.

YNP's Lamar River Valley provides a unique open setting with excellent viewing opportunities for wolves, grizzlies, and elk. Large numbers of visitors now go to this area in the spring and early summer specifically to see wolves. Over 20,000 visitors have actually seen wolves in the park since reintroduction (R. McIntire pers. comm.). In addition to those park visitors who travel to the Lamar Valley independently, a number of both for-profit and not-for-profit organizations have formed or located near Yellowstone in recent years to provide wolf-watching tours. These operators (including operations out of Bozeman, Gardiner, and Livingston, Montana) charge up to $2,000 per week (J. Williams pers. comm.). Some business owners in Gardiner, Montana target their advertising to "wolf watchers."

It is possible to roughly estimate the economic impact on Montana from wildlife viewing specifically associated with wolves in YNP. Surveys have shown that 3.3% of visitors to YNP would not have made the trip if wolves were not present (Duffield et al. 2001). Of the 1.8 million visitors to YNP per year from outside the tri-state region, approximately 60,000 nonresident visitor trips are due to the presence of wolves.

Although wolf watching can take place throughout the park, it is concentrated in the Lamar Valley. Visitor use in the Lamar Valley is closely tied to the North Entrance (Gardiner, Montana) and the Northeast Entrance (Cooke City, Montana). A conservative assumption is that wolf-watching impacts are instead distributed proportionally to entry through all gates. Given that, about 65% of these wolf

watching visitors (or 39,000 people) enter the park by passing through West Yellowstone, Gardiner, or Cooke City. Expenditures of $293 per nonresident visitor implies a total nonresident expenditure in the Montana economy of $11.3 million per year due to the presence of wolves in YNP (Duffield et al. 2001).

While the experience of YNP and the Lamar Valley suggests that the presence of wolves in an ecosystem can have a strong positive impact on both visitors and a local economy, predicting a similar impact statewide is more difficult. As noted above, the Lamar Valley is a truly unique setting that allows for easy wolf watching in one of the nation's premiere national parks. The extent to which this type of setting and experience might be duplicated elsewhere in Montana is unknown. Despite the presence of wolves for a number of years in northwestern Montana and the Nine Mile Valley, no significant experience similar to that seen in YNP has developed, possibly due to the predominance of forested terrain. A small percentage of visitors to GNP specifically seek wolf-viewing opportunities along the western boundary, home of several wolf packs since the mid-1980s. However, most Glacier visitors gravitate to the spectacular scenery along the Going to the Sun Road.

FWP expects wolf-viewing opportunities to have a positive impact on recreational values in Montana. But at this point, the impact can't be quantified due to an absence of data. For example, we do not know how changes in the number of wolves affect the odds of seeing wolves or how increasing or decreasing viewing opportunities affect expenditures or net benefits. However, it is possible to estimate the number of individuals that may be positively affected. Both residents and visitors enjoy wildlife viewing experiences in Montana every year. The National Fishing and Hunting Survey reported that 341,000 residents age 16 and over (50% of Montana's population) and 511,000 nonresidents participated in wildlife watching in Montana during 2001 (USFWS and U.S. Department of Commerce 2002). Relative to the state population, the number of nonresident wildlife watching participants in Montana (74%) was similar to the estimate for Alaska and greater than that for any other state except Wyoming.

The addition of wolf viewing to the experiential aspect of these trips should positively impact the recreational values of many of these people. The size of the wolf population should be directly related to the positive value accruing to the individuals would seek out wolf viewing or hearing opportunities. As the alternative specifying the largest recovered population, the No Action Alternative would also likely have the greatest potential to positively impact recreational values among the five alternatives examined.

FWP Fiscal Impacts

FWP is primarily funded by user fees and federal excise taxes paid by hunters and anglers. The largest revenue source is the sale of hunting and fishing licenses. Annual license sales generate more than $30 million, $23 million of which is used for day-to-day operations. The balance is earmarked for specific programs like hunter access, conservation easements, and maintenance of property. More than $11 million in federal funds are also allocated to Montana based on formulas that consider the number of paid hunting and fishing license holders and the land and water area of the state.

Nonresidents are assessed higher fees than residents for hunting and angling opportunities. Montana statutes limit the number of licenses available to nonresidents for some hunting licenses. Even though the number of licenses sold is limited, revenues from nonresident license sales account for more than two-thirds of FWP's total license receipts.

How FWP revenue will be affected by each of the alternatives is an important consideration. Trends in license sales for the general elk license and the general deer license are largely influenced by factors such as elk or deer population status, hunter access, changing hunter demographics, or price, and not necessarily the presence or status of a recovered wolf population. However, a recovered wolf population

could more directly influence license sales for antlerless elk, deer B licenses, or moose. This is because FWP uses antlerless harvest to fine-tune ungulate population numbers in relation to management objectives. If localized deer or elk populations are negatively affected by wolf predation, hunter opportunity for antlerless animals could decrease. Conversely, if deer or elk populations were not affected by wolf predation and actually exceeded management objectives, opportunity for antlerless harvest would increase. Similarly, a recovered wolf population could more directly influence moose sales because all moose hunting is limited to permit-only opportunities. It is difficult to predict how antlerless opportunity will change in the future under this alternative.

Therefore, fiscal impacts to FWP are estimated based on the observed historic variation in statewide licenses sales due to all causes for antlerless elk permits, Deer B licenses, and moose permits. The FWP Commission establishes final quotas for these licenses and permits. Revenue derived from these sales will change in proportion to the historic variation in past availability and sales from 1990-2001. Table 34 summarizes the lower and upper bounds for the number of licenses/permits that would probably be available in 2015 and the revenue generated by selling them. Several assumptions were made and are footnoted. A major assumption is that prices are constant in real terms. But in fact, nonresident prices have increased significantly in the past decade.

Administration, Funding, and Legal Status

Under this alternative, FWP's role consists of informal consultation, with limited influence over wolf management outcomes. All decisions are made by USFWS and no significant administrative demands are expected for FWP. USFWS decisions would be made primarily at the local level, but the northern Rockies program is also guided by policy established within the national scope of wolf recovery. USFWS would still be required to consult with private individuals or businesses and other federal agencies under Section 7 of ESA.

Because the program remains with USFWS, the adequacy of future budgets is less certain. The Northern Rockies Wolf Recovery Program would be competing against other national interests and priorities to secure adequate funding and staff. Because the program is federal, budgeting is still accomplished through Congressional appropriations. Thus, adequate staffing to meet the needs of Montanans most directly affected by the presence of wolves is not assured. The expected shortfall in personnel and budgets to meet those needs could be problematic for Montana, particularly as needs in Idaho and Wyoming increase, too. WS costs will likely increase due to the higher number of wolves in more areas.

Because the gray wolf would still be protected under ESA, federal rules and regulations apply. Federal authorities, not state authorities, would prosecute violations of federal law or regulations. However, the gray wolf would remain listed as endangered under state law.

In addition to the existing fluctuations in license sales, FWP would incur up to $5,000 in administrative costs associated with informal consultations with USFWS. These expenditures would come out of the existing budget for the endangered species program. No new revenue would be generated through license sales for regulated harvest of wolves.

Physical Environment

No impacts to air, soil, or water resources are predicted under this alternative. Vegetation may be affected to the extent that wolf presence changes ungulate grazing patterns in localized areas (National Research Council 2002). Although wolf hair may capture and later redistribute noxious weed seeds, compared to other methods of seed dispersal, this will not be significant. No archeological sites would be disrupted by this alternative.

Table 34. Expected variation in FWP revenue from the changes expected in statewide license sales of antlerless elk permits, Deer B licenses, and moose permits in 2015, based on 2002 prices.

Species	Average Number Available 1990-2001 (1 standard deviation of the average)	Lower Bound of Availability	Upper Bound of Availability	Expected Variation in Revenue
ELK[a]				
	Antlerless Permits: 33,359 (+/-4,274)	29,085	37,633	
	Residents: 92% of 4,274 @ $19[b]			+/- $74,709
	Nonresidents: 8% of 4,274 @ $3			+/- $1,026
MOOSE[c]				
	Antlerless Permits: 687 (+/-56)	631	743	
	Residents: 97% of 56 @ $75			+/- $4,074
	Nonresidents: 3% of 56 @ $750			+/- $1,260
DEER[d]				
	Antlerless Harvest: 31,729 (+/-8,333)	23,396	40,062	
	Residents: 87% of 8,333 @ $8			+/- $57,997
	Nonresidents: 13% of 8,333 @ $75			+/- $81,247
TOTAL EXPECTED VARIATION IN REVENUE				+/- $220,313[e]

[a] Antlerless elk permits can only be obtained through the drawing. Nonresidents must have a valid B-10 license obtained through the big game combo drawings. These drawings are capped at 17,000 maximum with waiting lists are kept for any opportunities that may become available after the drawing. FWP assumed that the 17,000 cap would continue to be met. If desired, the successful nonresident may apply for an antlerless elk permit. From 1998-2001, approximately 8% of sales were to nonresidents and 92% of sales to residents.

[b] Because a general elk license is required to receive a special permit, FWP assumed that changes in permit availability would also affect general elk license sales. Expected variation in resident and nonresident permits is based on an assumption of simple apportionment of statewide variation to the residency classes. This procedure slightly understates the resident and nonresident variation estimates.

[c] Moose permits are only obtained through the drawing. The 10% maximum allocation to nonresidents is applied. However, from 1998-2001 about 3% went to nonresidents and 97% to residents. The 10% maximum is not guaranteed to nonresidents during the drawings; nonresidents compete equally with residents.

[d] Hunting opportunities for antlerless deer will be managed through quotas for Deer B antlerless licenses. Both residents and nonresidents may purchase these licenses either through the drawing or over the counter. Over the four-year period 1998-2001, approximately 13% of sales were to nonresidents and 87% to residents. The 10% maximum is lifted if residents have not purchased enough licenses to manage the populations.

[e] The total expected variation in revenue overstates the true statistical variation of this sum.

Short Term, Long Term, and Cumulative Effects

In the short term, this alternative represents the status quo. Impacts are primarily associated with livestock losses due to wolf depredation. Localized impacts to prey populations, individual outfitters, or individual businesses may also develop in the short term. Wolf numbers and distribution would increase in the absence of more proactive strategies. Hunter opportunity will continue to fluctuate through time for a variety of reasons, which may include wolf predation. The fluctuations may be more significant in localized areas due to locally high densities of wolves. The public and political debate over wolf restoration and subsequent management may become even more conflicted because wolves would still be listed under ESA, even though the northern Rockies population had achieved the biological recovery goal. Wolf recovery issues in the northern Rockies would still maintain their national scope and controversy. Federal resources utilized by the northern Rockies program would not be available for recovery efforts of other rare or more imperiled species. Social tolerance may decline in Montana and illegal killings may increase. The confusion over agency jurisdiction and management responsibility of an expanding population may continue. The cumulative impacts of FWP not preparing a management plan are borne by the Montana citizens more so than FWP. Some citizens' interests and needs may not be met as responsively or proactively as desired.

Mitigation

Because FWP would have very little participation in wolf management, there is little that FWP could do to mitigate the negative impacts of this alternative directly, except to encourage USFWS to adjust the program. Examples would be to request that USFWS increase the Montana-based staff and increase the budget to maintain effective monitoring of the expanding population and to respond to conflicts. FWP could also encourage USFWS to adopt more flexible regulations both for agencies and livestock producers. Livestock producers themselves could decrease their risk of wolf depredation by adapting certain management practices, although the risk can never be fully eliminated. USFWS and WS could devote more effort proactively towards preventing wolf depredation on livestock. Livestock losses would be partially mitigated by compensation payments made by Defenders of Wildlife. Defenders of Wildlife may also cost-share a portion of the expenses associated with changes in husbandry.

FWP could more directly mitigate for localized impacts to ungulate populations by decreasing hunter opportunity, particularly for antlerless animals. In so doing, FWP would attempt to dampen a population decline or hasten a population increase. FWP could also augment ungulate populations from other sources.

Irretrievable Commitments

Wolves will be present in Montana, and under this alternative, USFWS retains management authority. That commitment is irretrievable until FWP restarts the planning process. In the mean time, USFWS commits resources that could have otherwise been allocated to recovering other imperiled species. FWP would commit some administrative staff time to informal consultations with USFWS that could otherwise be devoted to other activities.

Some wolves will kill livestock. Even though wolves are not expected to have a significant effect on the livestock industry as a whole, some livestock producers could sustain substantial losses in a given year. The number of depredations will likely vary widely among years, but over the long term some livestock losses will be an irreversible commitment of resources. Any compensation paid by private groups to livestock operators will be irretrievable by the group paying the compensation.

Alternative 2. Updated Council, *FWP's Preferred Alternative*

For comparison, the environmental consequences of this and the other alternatives are presented in a summary at the end of this chapter (Table 43).

Biological Environment

Wolf Management. FWP would implement an adaptive approach to manage wolves in Montana. The adaptive management trigger that would allow FWP to move from conservative to liberal management tools and vice versa is 15 breeding pairs (federal recovery definition). If the wolf population increases at the low rate, liberal management tools could be implemented starting in 2006. If the population grew at the higher rate, liberal management tools could be implemented in 2004. It is possible that the adaptive management trigger would be reached before 2004 or 2006, depending on how fast the population actually grows. Wolf numbers and pack sizes would be managed proactively to meet the needs of wolves and people. Most importantly, wolf management would be integrated into the larger wildlife program and managed in an ecological context similar to other large carnivores. Conservation and management measures of this alternative would secure the wolf population into the future.

To that end, some packs, such as those occurring in mixed landownership patterns interspersed with livestock, will require more management attention. Other packs, such as those in remote public land areas, would require less attention. Resolution of conflicts would be incremental, depending on where the territory is located and the degree, frequency, and types of conflicts that occur with livestock, people, or prey.

Wolves would be managed as a "species in need of management" which grants full legal protection from indiscriminant human-caused mortality. However, wolves could still be harassed, injured, or killed through agency control actions and by private landowners or livestock owners under certain permitted conditions. When the number of breeding pairs exceeds 15 and it becomes biologically sustainable to do so, FWP would introduce regulated harvest as a proactive management tool to adjust wolf numbers and distribution in relation to their local environment.

Wolf Numbers and Distribution. Approximately 328-657 wolves (or 27-54 breeding pairs according to the federal recovery definition) would be present in Montana in 2015. This is fewer than Alternative 1 (No Action). FWP expects the population to be near the lower end of the range. It is possible that the number would be less than 328 if the population grows more slowly than predicted. Wolf numbers will fluctuate because of management actions, changes in prey density and distribution, disease, and intraspecific competition. Wolf numbers will not be administratively capped, but will be managed adaptively in keeping with solid principles of wildlife management and the factors affecting social tolerance. This population would be secure and still allow flexibility for FWP, without worrying about whether the population would drop unexpectedly close to the relisting level due to unforeseen events.

Wolf distribution will increase as individual wolves disperse from core areas and colonize new habitats with sufficient prey. Wolves will probably be distributed primarily in western, west central, and south central Montana, although wolves could also expand their distribution into eastern Montana in the absence of significant social conflicts, much as mountain lions did over the last 20 years. For example, wolves could become established in island mountain ranges, such as the Big and Little Snowies or even farther east if there is an adequate prey base and little social conflict. Wolf densities would be lower because prey densities are typically lower. Ultimately, the complex biological and social environment, rather than administrative zones, would guide distribution. Wolves would be encouraged on remote public lands and integrated into mixed land ownerships. Wolves would be allowed on FWP WMAs.

This is consistent with existing policies that these lands were purchased to benefit all wildlife, but that they be managed with particular attention to wintering big game.

Wolf Habitat, Connectivity, and Land Management. Connectivity requirements are met because the wolf population should provide an adequate number of dispersers that emigrate to Idaho, Canada, or Wyoming. Furthermore, wolves coming to Montana from these other areas should have a greater chance to join an existing pack or locate other dispersers to start a new pack. FWP would continue to participate in technical discussions with land management agencies and the Montana Department of Transportation about habitat connectivity issues for wide ranging carnivore species. Public land management activities, whether logging, grazing, or travel management are not affected by this alternative, although land management agencies may adopt policies or make changes for other management purposes. Land managers may adopt localized area closures around dens or rendezvous sites, particularly within national parks. FWP would continue to work with land management agencies and private landowners on projects to enhance wildlife habitats.

Monitoring. Through the monitoring program, FWP will ensure that the Montana population is secure and above the recovery goal. It is also an important component of the adaptive management framework so that FWP can evaluate the effects and outcomes of management decisions. This new information will also improve management decisions. The monitoring program will also allow FWP to document wolf activity in new areas as well as the status of existing packs. This in turn, will allow FWP to more closely monitor certain ungulate populations or to coordinate more closely with land managers or private landowners.

During the first five years of implementation, FWP will monitor the Montana wolf population and tabulate the number of breeding pairs according to the federal recovery definition and the more general definition of social groups (four or more traveling in winter). If the more general definition adequately demonstrates reproduction and the security of Montana's gray wolf population and that the number of breeding pairs in Montana satisfies the legal requirement, FWP will adopt the more general definition. Furthermore, FWP will reduce monitoring intensity for some packs in remote areas that have a small likelihood of causing conflicts. This would allow personnel to focus more monitoring effort on other packs with a higher probability for conflict. The monitoring budget would also be used more effectively or even be decreased to meet wildlife monitoring needs for other species.

Monitoring responsibilities for boundary packs would be shared between FWP and the adjacent jurisdiction. Additional administrative time will be required to share information or coordinate field activities.

Prey Populations. At the regional and statewide scale, prey populations will fluctuate through time due to all causes of mortality (e.g. predation, natural mortality, human hunting, habitat conditions, and weather events) similar to the historical patterns described in Chapter 2 (Existing Environment). At a localized level, prey populations may be more influenced by wolf predation, particularly in combination with predation by other large carnivores. Predation pressures may exaggerate a population decline initiated by unfavorable weather events or even slow population recovery, particularly if human harvest rates of antlerless animals are too high. Localized prey populations may even stabilize at a smaller level. Wolf predation on small ungulate populations, even if infrequent, may be more influential on population trend than for larger ungulate populations because predation may remove a greater proportion of the herd.

Under this alternative, FWP would be able to manage gray wolves and ungulates in an integrated, ecological manner and within the context of other environmental factors. If a local prey population were significantly impacted by wolf predation in conjunction with other environmental factors, FWP would consider reducing wolf pack size. If there were fewer than 15 breeding pairs, relocation would be

considered. If there are more than 15 breeding pair, FWP will reduce pack size through liberal management tools, which could include regulated hunting or trapping. Wolf management actions would be paired with other corrective measures to reduce ungulate mortality or enhance recruitment such as decreasing hunter opportunity for antlerless animals.

FWP would not significantly change the principles and philosophies guiding ungulate population management in response to the added management authority for the gray wolf. Ungulate management will continue to be based on the best available scientific information and the established management objectives. FWP actions under this alternative would improve how ungulate and carnivore populations are managed overall because monitoring programs would be improved and FWP would have management authority for both an important predator species and its prey.

Other Wildlife. Some wildlife species would benefit from implementation of this alternative because the gray wolf is an important link in the food chain. In addition, wolf predation tends to remove old, sick, or debilitated animals from the population, although this is not always the case because young and healthy animals are also vulnerable to wolf predation. Wolf kills are visited by a wide variety of scavenging species which directly benefit from this food source on a year round basis. The presence of wolves is also thought to enhance ecosystem functioning by changing ungulate habitat use patterns. Other wildlife species may be impacted directly through predation or indirectly through competition for food resources or space. For example, some local mountain lion populations may decline in the general vicinity of wolf pack territories. The magnitude of these positive and negative consequences are difficult to predict, but are expected to occur on a localized level where wolves become established. By having management authority for the gray wolf, FWP could more thoroughly integrate and account for the needs of the other wildlife species that it is charged to manage and conserve.

Human Environment

Social Factors. Wolf restoration has been a divisive issue among Montanans. While some Montanans are supportive of wolf presence, others are totally opposed. . Still others are supportive so long as the needs of those most affected by wolf presence are addressed and as long as the program balances the needs of wolves and people. There are also differing opinions about who should be the lead agency and whether wolves should stay listed in perpetuity. People in northwestern Montana have largely adjusted to wolf presence since wolves have been in the area going back to the mid 1980s. Elsewhere in Montana, citizens are still adjusting to the presence of a newly introduced population. The adaptive approach outlined in this alternative would allow FWP to meet the differing management expectations and needs that exist across the spectrum of social values. It incorporates flexibility for landowners, livestock producers, FWP, and provides for a secure wolf population into the future. Most importantly, Montana citizens would have a stronger voice in wolf conservation and management in their state because the program would be administered from a local perspective, rather than a national perspective.

By FWP assuming management responsibility, citizens that perceive wolves as a "cost" are negatively impacted in the sense that FWP would "have to" manage wolves in order to get the species delisted. On the other hand, citizens that perceive wolves as "neutral" or as a "benefit" could be positively affected by the implementation of a proactive, responsive program at the state level. Either way, the alternative calls on the public to accept the legitimacy of FWP to manage gray wolves and that wolf conservation and management will be integrated within the context of modern scientific wildlife management.

Public Outreach. FWP would be able to increase public outreach activities beyond what is possible under Alternative 1 (No Action) because FWP has dedicated personnel to fulfill public information and educational needs. These personnel are also distributed throughout the state. Public awareness and improved understanding about the conservation and management program should decrease the emotional

controversy, improve communications with the public, increase public acceptance of the program, and improve management decisions. The public's safety would be enhanced because FWP could more effectively provide information about the dangers of habituating wolves and safety tips about what to do during encounters.

Human Safety. People may encounter wolves more frequently as the population increases in number and distribution. In the presence of an immediate threat to themselves or another, a person may legally harass, injure, or kill wolves under state law. FWP, WS, or local authorities may harass or kill wolves that threaten public safety. Individuals found to injure or kill a wolf in the absence of a direct and immediate threat or otherwise outside the provisions of Montana law would be prosecuted under state laws. Upon delisting from the federal and state lists, Montanans will be able to defend their domestic dog if it is being attacked or killed by a wolf. Overall, public safety will be enhanced through timely agency response and discouragement of wolf habituation.

Private Property. FWP does not intend to restrict private property uses to manage a recovered wolf population. While wolf use is primarily on public lands, some use of private lands does occur. Use of private lands will undoubtedly increase in the future with increasing wolf numbers. FWP acknowledges that wolves will use public lands in close proximity to private property. Use of private lands will increase in the future with increasing wolf numbers, and conflicts may occur more frequently.

FWP would proactively work with landowners to address their concerns about wolf use or to provide technical assistance. FWP and WS would attempt to remove problem wolves in a timely, efficient manner according to the adaptive management tools outlined in this alternative. Resolution may result in the harassment or killing of wolves by agencies or by the landowner, under certain permitted conditions. In some circumstances, wolves could be injured or killed by private citizens in defense of livestock or domestic dogs. If not under immediate voice command, lion hounds or bird hunting dogs may be injured or killed in wolf encounters. The economic impacts of wolf-livestock conflicts are addressed below.

Economics / Livelihoods

Livestock Depredation. Approximately 328-657 wolves would be present in Montana in 2015. Liberal management tools would be implemented in 2006 if the population grew at the lower rate. If the population grew at the higher rate, liberal tools would be implemented in 2004. Liberal management tools are specifically intended to decrease livestock depredations and allow livestock owners to harass wolves opportunistically, kill wolves caught attacking, killing, or threatening their stock, or receive a special kill permit to remove a wolf or wolves causing chronic conflicts. Because of this increased flexibility for livestock producers, FWP expects the depredation rate under this alternative to be about one half of historical depredation rates. Additionally, adaptive management of the overall wolf population, combined with removal of problem wolves, should result in lower livestock losses and greater social tolerance (see Haight et al. 2002). The increased emphasis on working with landowners proactively to minimize the risk of depredation is intended to decrease the overall losses.

Approximately 25-51 cattle and 29-58 sheep would be lost to confirmed wolf depredation in 2015. Another 16-31 cattle and 3-5 sheep could be tallied as probable wolf depredation (Table 35). These numbers reflect the assumption that liberal management tools would reduce the potential losses by 50%, compared to the losses per wolf in Alternative 1 (No Action). Liberal tools may actually reduce the potential more or less than 50%. These losses are less than those predicted under Alternative 1 (No Action). FWP and WS would proactively work to minimize the potential for depredation through technical assistance. Losses are likely to be less during the early years of implementation because the wolf population would be smaller.

Whenever the adaptive management trigger of 15 breeding pairs is exceeded, FWP intends to implement a variety of more liberal management tools. These include regulated harvest to help proactively manage total wolf numbers in the population (and the number of wolves per pack by default) and removal of problem animals. These tools are paired with the increased work by FWP, WS, and others to provide technical assistance to private landowners to minimize their risks to the extent possible. These strategies combined reduced depredation by at least 70% and decreased economic losses in a computer simulation model examining a variety of animal damage control strategies for wolves in the Great Lakes (Haight et al. 2002). FWP does not believe that field results in Montana would mimic computer-generated results. However, the results of the study did suggest that the combination of voluntary proactive changes to agricultural practices, in combination with proactive agency management of the number of wolves in the population, and removal of depredating wolves would reduce depredation losses significantly.

Montana Agricultural Statistics Service (2002) reports that, as of January 1, 2001, the average value of all cattle in Montana was $850 per head. Sheep averaged $94 per head. Purebred lines may, in fact, have a significantly higher value, while other animals may have a significantly lower value. The predicted economic loss for confirmed livestock depredation, probable depredation, and loss of other domestic animals is $40,935 - $81,770 (Table 35). This is less than the predicted economic losses for Alternative 1 (No Action). Adaptive management of the overall wolf population, combined with removal of problem wolves, should decrease economic losses (see Haight et al. 2002). Livestock producers may incur other expenses, including increased management costs due to changes in husbandry practices or materials to improve the physical security of animals (e.g. night pens). These costs are difficult to estimate and have not been quantified. Presumably, livestock producers already incur some management costs to mitigate for predator losses.

The estimated annual livestock depredation losses for this alternative are small compared to either the statewide value of annual sheep and cattle production or to the level of annual livestock losses to predators other than wolves and to natural causes. But wolf losses are not spread evenly among all Montana livestock producers or shared by the industry as a whole. These losses are borne by individual livestock producers and the losses may, in fact, be significant in proportion to the size of the operation. And, these losses represent a new, added risk to some individual livestock producers, depending on where they are geographically in relation to wolf pack territories. Under this alternative, livestock producers are assured that FWP will work toward securing a source of compensation funding or livestock insurance.

Big Game Hunting. Same as Alternative 1 (No Action), but localized impacts expected to be less significant.

Regional Economic Activity. Same as Alternative 1 (No Action), but localized changes expected to be less.

Outfitting Industry. Same as Alternative 1 (No Action), but localized impacts expected to be less significant.

Recreational Values

Hunting Values. Same as Alternative 1 (No Action), but localized impacts expected to be less significant.

Wildlife Viewing and Recreational Trip Values. Same as Alternative 1 (No Action).

Table 35. Estimated livestock losses (confirmed and probable) and the economic value of livestock and domestic animal losses in the year 2015 for Alternative 2 (Updated Council). The columns may not sum, due to rounding.

Type of Loss	Number of Animals Lost		Value per Head[a]	Total Value of Loss	
	Low	High		Low	High
Confirmed Cattle	25	51	$850	$21,250	$43,350
Confirmed Sheep	29	58	$94	$2,726	$5,452
Confirmed Total Value				$23,976	$48,802
Probable Cattle	16	31	$850	$13,600	$26,350
Probable Sheep	3	5	$94	$282	$470
Probable Total Value				$13,882	$26,820
Total cattle and sheep losses				$37,858	$75,622
Estimated Loss of Other Domestic Animals[b]				$3,077	$6,148
TOTAL ESTIMATED ANNUAL LOSS				$40,935	$81,770

[a] Average value of all sheep and lambs and all cattle, 2001 Montana Agricultural Statistics.
[b] Historically, Defenders of Wildlife compensation payments for other domestic animals (guarding dogs, horses, or llamas) was 8.13% of the total payments for cattle and sheep.

FWP Fiscal Impacts

Fiscal impacts describe the changes in revenue from license sales, the cost of implementing the program, and the potential sources of revenue to fund it. License revenue from antlerless elk permits, deer B licenses, and moose permits could vary by $220,313 annually, the same as for Alternative 1 (No Action). FWP's projected budget to implement this alternative is $774,046 and includes an extra $50,000 specifically for the extra preventative work by FWP, WS, or other cooperators (Table 36). An additional $40,935 – $81,770 is shown for compensation for livestock losses, but FWP monies, matching federal grants or state general fund money, would not fund it. FWP would implement this alternative through a combination of state, federal, and private sources. FWP's contribution would be commensurate with its expenditures for other carnivore management programs and would include license revenue, since FWP intends to use regulated wolf harvest as a management tool if it is biologically sustainable. If a regulated wolf harvest were to be implemented, some license revenue would be generated, but the amount can't be predicted at this time. It would depend on how many licenses are sold and the cost of the license. The number of licenses available would be a function of wolf population status, management objectives, and other mortality factors.

Table 36 represents a plausible budget to implement this alternative. The budget reflects the comprehensive nature of designing and implementing a wolf management program. While this budget represents FWP's best projection of the resources required, FWP cannot assess its accuracy until the agency actually assumes management authority and begins implementation. Some components of the wolf program may not be captured fully by this budget. There may also be costs that could not be predicted at this time or were unforeseen.

Table 36. Implementation budget for Alternative 2 (Updated Council).

Division / Activity	Estimated Budget
Montana Fish, Wildlife & Parks	
Wildlife Division (Staff 4.30 FTE)	
Biologists (4.0 FTE)	$149,516
Operations	$156,000
Enhanced Ungulate Monitoring	$ 50,000
Wildlife Lab (.30 FTE)	$ 8,280
Wildlife Lab Operations	$ 7,000
Total	**$370,796**
Enforcement Division (Staff 2.5 FTE)	
Staff	$ 86,250
Operations	$ 70,500
Total	**$156,750**
Conservation Education Division (staff 0.75 FTE)	
Information Officer (.50 FTE)	$ 29,000
Headquarters Staff (.25 FTE)	$ 14,500
Operations	$ 6,000
Total	**$ 49,500**
Administration and Finance Division (staff 0.75 FTE)	
Program Coordination (Hdqtrs/Field) (.5 FTE)	$ 27,000
Support Staff (Hdqtrs/Field)(.25 FTE)	$ 10,000
Operations	$ 10,000
Total	**$ 47,000**
Proactive, preventative efforts by FWP, Wildlife Services, or other cooperators	**$50,000**
Depredation: Wildlife Services (USDA/APHIS) Cooperative Wolf Damage Management and FWP-directed Predator Control	**$100,000**
FWP ANNUAL TOTAL	**$774,046**
Compensation (money from private source)	**$ 40,935 – $81,770**
PROGRAM TOTAL (Including Compensation)	**$814,981 – 855,816**

Administration, Funding, and Legal Status

FWP would be the lead agency for wolf conservation and management in Montana. Decisions are made by FWP, the FWP Commission, or the Montana Legislature. Through an MOU, WS would be an important partner. FWP expects increased consultation with tribal authorities, the states of Idaho and Wyoming, NPS, or others with overlapping interests. This is particularly true for wolf packs that overlap more than one management jurisdiction. FWP will also invest more time in coordination and technical assistance activities with WS, federal land management agencies, private landowners, or other cooperators to proactively reduce the potential for wolf-livestock conflicts. FWP can more thoroughly integrate wildlife management programs by assuming management authority for the gray wolf, even though management decisions may be controversial. USFWS would oversee FWP implementation of the program for five years to ensure that the wolf population would not be in jeopardy of relisting under ESA.

Many new wolf management activities fall within existing duties and responsibilities already carried out by FWP or WS. But, some activities would clearly add to existing responsibilities and workloads. Some wildlife biologists, for example, would have new wolf monitoring responsibilities. Some segments of the public will expect the same intense level of monitoring and wolf control currently carried out by the USFWS and WS. FWP field wardens would now investigate potential illegal wolf mortalities. Other changes for wardens and/or biologists may include: working with landowners to address concerns, handling or referring livestock damage calls, responding to wolf sightings and perceived threats to public safety, increased ungulate monitoring effort, addressing hunter concerns and complaints associated with wolves, and responding to reports of injured or road-killed wolves. The FWP Wildlife Laboratory will experience an increased workload associated with processing wolf carcasses, fulfilling wolf health and disease surveillance responsibilities, and filling educational requests. Existing budget and personnel resources cannot absorb this expansion.

Because FWP needs supplemental sources of funding to implement this alternative, it would be working to secure the funding while the gray wolf is still listed. FWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources.

State laws and FWP administrative rules would now guide management and establish the legal framework. The gray wolf would be removed from the state's endangered species list and reclassified as a "species in need of management." FWP would seek state legislation to make the unlawful taking of a gray wolf a misdemeanor and to include the species under the restitution section of MCA 87-1-111. These changes would allow more effective law enforcement and serve as a greater deterrent to indiscriminant killing. These changes would be consistent with how black bears and mountain lions are treated in Montana statute.

Physical Environment

Same as Alternative 1 (No Action).

Short Term, Long Term, and Cumulative Effects

During the first five years after delisting, FWP will implement the program but will be overseen by USFWS. Ongoing informal consultation may be required as FWP personnel gain more experience with wolves. The public will also be making that transition as well. Wolf numbers will probably increase and so will wolf distribution. Localized impacts to prey populations, individual outfitters, or individual businesses may also develop in the short term. Hunter opportunity will still continue to fluctuate for a variety of reasons, which may include wolf predation. Livestock losses to wolves will still be documented and increased management costs will still affect individual producers. Over the long term, gray wolves should become more accepted in Montana because the management program is flexible, responsive, and adaptive to people and the wolf population. Conflicted public debate and controversy should decrease because the program is guided by local interests, while still meeting our legal responsibility to maintain a viable population into the future.

Mitigation

One benefit of an adaptive management approach is that it allows FWP to manage the Montana wolf population with a fair degree of flexibility to meet different needs and expectations. To that end, many of the management tools within this alternative are designed to mitigate the potential for negative impacts of a recovered population while, at the same time, maximizing the benefits to the degree possible in a

complex environment. The management tools could be applied locally or across a larger area. Wolf numbers and distribution can be adjusted locally to address specific needs, mitigate impacts, or resolve chronic conflicts. Concerns about ungulate populations can also be addressed through the tools identified in this alternative, including enhanced monitoring effort where wolves are established.

Mitigation for the economic losses to individual livestock producers would be enhanced by the increased flexibility and innovative approaches to deter livestock depredations. Providing producers with the flexibility to defend their livestock if a wolf is attacking it, or to receive a special kill permit to resolve a conflict themselves mitigates livestock losses to some degree, but does not eliminate them entirely. Economic losses would still be mitigated to some extent because the State of Montana would create an entity to administrator a compensation program, although it would be funded and independent from FWP. In addition, Defenders of Wildlife or a livestock insurance program could also help address economic costs to individual livestock producers for losses or increased management costs. Adequate funding from outside sources should alleviate most potential FWP fiscal impacts.

Irretrievable Commitments

Under this alternative, FWP would make a commitment to conserve and manage the gray wolf and integrate it within the wildlife program. That commitment would be irretrievable in the sense that FWP does not intend to default on its legal responsibilities to maintain a secure viable population in the future. By assuming the leadership role for wolf management, FWP would be committing staff and financial resources to fulfill the needs of the program. Those resources would be partially unavailable to other program areas to the extent that responsibilities and activities don't overlap.

The adaptive management tools within this alternative will mitigate to a large degree many potentially irretrievable commitments of resources or changes in resource status. However, some wolves will kill livestock. Even though wolves are not expected to have a significant effect on the livestock industry, a few livestock producers could sustain substantial losses in a given year. The number of depredations will likely vary widely among years, but over the long term some livestock losses will be an irreversible commitment of resources. Any compensation paid by private groups to livestock operators will be irretrievable by the group paying the compensation.

Alternative 3. Additional Wolf

For comparison, the environmental consequences of this and all the alternatives are presented in a summary at the end of this chapter (Table 43).

Biological Environment

Wolf Management. Same as Alternative 2 (Updated Council), but FWP's adaptive management approach increases from 15 to 20 the number of breeding pairs (according to the federal recovery definition) that would signal a change from conservative to liberal management tools and vice versa. Because the trigger is raised to 20 breeding pairs under this alternative, it will take longer for the wolf population to reach the trigger compared to Alternative 2 (Updated Council). If the wolf population increases at the low rate, liberal management tools could be implemented starting in 2008. If the population grew at the higher rate, liberal management tools could be implemented in 2006.

Wolf Numbers and Distribution. The statewide population is predicted to be 365-807 wolves (or 30-66 breeding pairs according to the federal recovery definition) in 2015. This is more than Alternative 2 (Updated Council). It is possible that there would be fewer wolves if the population grows more slowly than predicted. This population would be secure and still allow adequate management flexibility for FWP without worrying about whether the population would drop unexpectedly close to the relisting level due to unforeseen events. Wolf distribution would be the same as Alternative 2 (Updated Council).

Wolf Habitat, Connectivity, and Land Management. Most environmental consequences are the same as for Alternative 2 (Updated Council). As a result of increasing the adaptive management trigger to 20 breeding pair, the overall population would be larger and dispersal events should be more frequent. Therefore connectivity among the wolf sub-populations in Canada, Montana, Idaho, and Wyoming should be enhanced above Alternative 2 (Updated Council).

Monitoring. Same as Alternative 2 (Updated Council).

Prey Populations. Same as Alternative 2 (Updated Council). Prey populations are expected to fluctuate through time as described previously. FWP would not change how ungulates are managed in response to the added management authority for the gray wolf. However, under this alternative, more wolves would be present in the population. Therefore, ungulate monitoring efforts would be increased over what was described for Alternative 2.

Other Wildlife. Same as Alternative 2 (Updated Council).

Human Environment

Social Factors. Same as Alternative 2 (Updated Council). But to address the social factors surrounding a state wolf management program, FWP proposes to host an annual workshop and interagency coordination meeting rather than appoint a "standing council." One annual event would be less expensive than multiple meetings throughout the year, so FWP would realize a modest decrease in administrative costs. FWP and other agencies or jurisdictions with overlapping interests could modify management strategies. Communication would be improved between agencies and the public, and more Montanans could be involved in crafting solutions to shortcomings of the program. Some administrative work would be required to organize the meeting as well as to follow up on meeting outcomes and/or implementation.

Public Outreach. Same as Alternative 2 (Updated Council).

Human Safety. Same as Alternative 2 (Updated Council).

Private Property. Same as Alternative 2 (Updated Council).

Economics / Livelihoods

Livestock Depredation. Most of the environmental consequences are the same as Alternative 2 (Updated Council). Owing to the larger wolf population and the 1-2 year delay in implementing liberal management tools, FWP predicts that both confirmed and probable livestock losses will be slightly higher compared to Alternative 2 (Updated Council) but lower than Alternative 1 (No Action). Approximately 28-62 cattle and 32-71 sheep would be lost to confirmed wolf depredation in 2015. Another 17-38 cattle and 3-6 sheep would be lost to probable wolf depredation (Table 37). These numbers reflect the assumption that liberal management tools would reduce the potential losses by 50%, compared to the losses per wolf for Alternative 1 (No Action). Liberal tools may actually reduce the potential by more or

less than 50%. FWP and WS would work even more proactively than outlined for Alternative 2 to minimize the potential risk of depredations through technical assistance. Losses are likely to be less than this amount during the early years of implementation because the wolf population would be smaller.

The predicted economic loss for confirmed losses, probable losses and the loss of other domestic animals is $44,917-$99,736 (Table 37). This is less than Alternative 1 (No Action), but more than Alternative 2 (Updated Council). Adaptive management of the overall wolf population, combined with removal of problem wolves, should decrease the number of livestock killed and the resulting economic losses (see Haight et al. 2002). The increased emphasis on working with landowners proactively to minimize the risk of depredation is intended to decrease the overall losses.

Whenever the adaptive management trigger of 20 breeding pairs is exceeded, FWP intends to implement a variety of liberal management tools. These include regulated harvest to help proactively manage total wolf numbers in the population (and the number of wolves per pack by default) and removal of problem animals. These tools are paired with the increased work by FWP, WS, and others to provide technical assistance to private landowners to minimize their risks to the extent possible. These strategies combined reduced depredation by at least 70% and decreased economic losses in a computer simulation model examining a variety of animal damage control strategies for wolves in the Great Lakes (Haight et al. 2002). FWP does not believe that field results in Montana would mimic computer-generated results. However, the results of the study did suggest that the combination of voluntary proactive changes to agricultural practices, in combination with proactive management of the number of wolves in the population, and removal of depredating wolves would reduce depredation losses significantly.

The estimated annual livestock depredation losses for this alternative are small compared to either the statewide value of annual cattle and sheep production or to the level of annual livestock losses to predators other than wolves and to natural causes. But wolf losses are not spread evenly among all Montana livestock producers or shared by the industry as a whole. These losses are borne by individual livestock producers and the losses may in fact, be significant in proportion to the size of the operation. Furthermore, these losses represent a new added risk to some individual livestock producers, depending on where they are geographically with respect to wolf pack territories.

Under this alternative, FWP would not actively promote or facilitate creation of an entity to fund and administer a compensation program should the private programs be discontinued. Defenders of Wildlife, another private organization, or even a livestock insurance program may still compensate livestock producers for their losses. Therefore, economic losses to individual producers would only decrease to the extent that FWP's management program decreased the number of depredation incidents or decreased other expenses incurred by changing husbandry practices.

Big Game Hunting. Same as Alternative 2 (Updated Council).

Regional Economic Activity. Same as Alternative 2 (Updated Council).

Outfitting Industry. Same as Alternative 2 (Updated Council).

Recreational Values.

Hunting Values. Same as Alternative 2 (Updated Council).

Wildlife Viewing and Recreational Trip Values. Same as Alternative 2 (Updated Council)

Table 37. Estimated livestock losses (confirmed and probable) and the economic value of livestock and domestic animal losses in the year 2015 for Alternative 3 (Additional Wolf). The columns may not sum, due to rounding.

Type of Loss	Number of Animals Lost		Value per Head[a]	Total Value of Loss	
	Low	High		Low	High
Confirmed Cattle	28	62	$850	$23,800	$52,700
Confirmed Sheep	32	71	$94	$3,008	$6,674
Confirmed Total Value				$26,808	$59,374
Probable Cattle	17	38	$850	$14,450	$32,300
Probable Sheep	3	6	$94	$282	$564
Probable Total Value				$14,732	$32,864
Total cattle and sheep losses				$41,540	$92,238
Estimated Loss of Other Domestic Animals[b]				$3,377	7,498
TOTAL ESTIMATED ANNUAL LOSS				$44,917	$99,736

[a] Average value of all sheep and lambs and all cattle, 2001 Montana Agricultural Statistics.
[b] Historically, Defenders of Wildlife compensation payments for other domestic animals (guarding dogs, horses, or llamas) was 8.13% of the total payments for cattle and sheep.

FWP Fiscal Impacts

Fiscal impacts under this alternative are similar to Alternative 2 (Updated Council). FWP anticipates some changes in revenue associated with antlerless elk permits, deer B licenses, and moose permits, but it will be similar to historic fluctuations. Some license revenue could be expected if FWP were to implement regulated harvest for wolves sometime in the future. However, the projected budget is amended to reflect 2 changes (Table 38). The amount for enhanced ungulate monitoring increased from $50,000 to $75,000 per year and the compensation program is not shown. The budget also includes as a separate line item the $50,000 to fund extra preventative work by FWP, WS, and others. FWP's predicted budget to implement this alternative is $799,046.

Administration, Funding, and Legal Status

Same as Alternative 2 (Updated Council).

Physical Environment

Same as Alternative 1 (No Action).

Short Term, Long Term, and Cumulative Effects

The environmental consequences of this alternative will be similar to Alternative 2 (Updated Council). Over the longer term, the consequences increase because of higher livestock losses that overall management strategies and approaches to minimize risk may or may not mitigate completely. The absence of a compensation program actively promoted by FWP means that the resultant economic costs of whatever livestock are lost would be borne by the livestock producer.

Mitigation

Mitigation for this alternative is similar to Alternative 2 (Updated Council). Mitigation for the increased economic losses to individual livestock producers would be enhanced by the increased flexibility and innovative approaches to deter livestock depredations.

Irretrievable Commitments

Same as Alternative 2 (Updated Council). In the absence of a compensation program, the economic losses are irretrievable.

Table 38. Implementation budget for Alternative 3 (Additional Wolf). Asterisk denotes a change from the budget for Alternative 2 (Updated Council).

Division / Activity	Estimated Budget
Montana Fish, Wildlife & Parks	
Wildlife Division (Staff 4.30 FTE)	
Biologists (4.0 FTE)	$149,516
Operations	$156,000
Enhanced Ungulate Monitoring*	$ 75,000*
Wildlife Lab (.30 FTE)	$ 8,280
Wildlife Lab Operations	$ 7,000
Total	**$395,796**
Enforcement Division (Staff 2.5 FTE)	
Staff	$ 86,250
Operations	$ 70,500
Total	**$156,750**
Conservation Education Division (staff 0.75 FTE)	
Information Officer (.50 FTE)	$ 29,000
Headquarters Staff (.25 FTE)	$ 14,500
Operations	$ 6,000
Total	**$ 49,500**
Administration and Finance Division (staff 0.75 FTE)	
Program Coordination (Hdqtrs/Field) (.5 FTE)	$ 27,000
Support Staff (Hdqtrs/Field)(.25 FTE)	$ 10,000
Operations	$ 10,000
Total	**$47,000**
Proactive, preventative efforts by FWP, Wildlife Services, or others	**$50,000**
Depredation (Wildlife Services Cooperative Wolf Damage Management and FWP-directed Predator Control)	**$100,000**
FWP ANNUAL TOTAL	**$799,046**

Alternative 4. Minimum Wolf

For comparison, the environmental consequences of this and the other alternatives are presented in a summary at the end of this chapter (Table 43).

Biological Environment

Wolf Management. FWP would implement an aggressive program that manages the gray wolf at the minimum legal requirements. Although many of the management tools would be the same as for Alternatives 2 (Updated Council) and 3 (Additional Wolf), they would not be implemented adaptively. Aggressive WS control actions, coupled with landowner removals would keep the population at the minimum level to avoid relisting. Private landowners would have more responsibility for control work on their property. Wolves would be harassed more routinely and killed more often than for the other alternatives. Regulated harvest would not be implemented consistently over time because aggressive wolf control by landowners and by WS is expected to keep wolf numbers low. Wolf packs near national parks would be managed more conservatively than other packs in the state, as an added measure of security that some natural dispersal could occur. FWP would apply the more strict federal definition of a breeding pair (federal recovery definition) because the program goal is to maintain the minimum number to prevent relisting. FWP would have less flexibility to adjust management in that every wolf or pack would be an important contribution to the total population because the population would be close to the minimum required.

Gray wolves would be managed as a "species in need of management" which grants full legal protection from indiscriminant killing. However, significant wolf mortality may be necessary through the provision for special kill permits issued to landowners and through WS control actions to maintain wolf numbers near the cap. FWP would issue special kill permits at the level necessary to achieve enough mortality to maintain the population at the capped, minimum level. The species would not be integrated into the wildlife program in the context of modern scientific wildlife management, but would instead be treated separate and distinct.

Wolf Numbers and Distribution. Approximately 154 wolves would be present in Montana in 2015, which could be about 13 breeding pairs according to the federal recovery definition. It is the fewest of any alternative. If the number of wolves were greater at the time of actual delisting, FWP would accelerate control actions by WS or by private landowners and utilize a licensed hunting/trapping program to decrease the population until it was at the minimum. Total wolf numbers could fluctuate because of management actions, changes in prey densities, or intraspecific competition. The future population should be secure, but so close to the margin that it could drop below relisting criteria in the face of unexpected environmental events. If that should occur, FWP would have limited management flexibility and most management/control activities would be non-lethal.

Wolf distribution would be limited to western Montana by control actions. Wolves would be strongly discouraged in central and eastern Montana, on private lands, and on FWP WMAs. In western Montana, wolf distribution may ultimately be limited to federal public lands and national parks.

Wolf Habitat, Connectivity, and Land Management. Connectivity requirements would be met marginally and would have to be maintained by periodically relocating wolves. This tool is expensive, and it has had mixed success in the past. Connectivity of the tri-state population with Canada would occur because of more conservative management in northwest Montana. Public land management activities, whether logging, grazing, or travel management are not affected by this alternative, although managers may adopt policies or make changes for other purposes. Some land managers may adopt

localized area closures around den or rendezvous sites, especially within national parks. FWP would not invest much effort in coordinating with land managers or private landowners on wildlife habitat projects that would benefit wolves.

Monitoring. FWP will monitor the population to ensure that it is secure and above the recovery goal. Telemetry would be required to a greater extent under this alternative, and it will increase monitoring costs compared to the other alternatives. Monitoring efforts themselves must be very precise and reliable because it will be important to document every pack and its reproductive status to determine whether it could be tallied as a breeding pair. Wolves would be captured and handled more frequently to maintain telemetry contact with each pack. Significant effort must be committed to achieve the intensity required to document that Montana is meeting the minimum requirements.

Prey Populations. At the regional and statewide scale, prey populations will fluctuate through time due to all causes of mortality and environmental factors similar to the historical patterns described in Chapter 2. At the localized level, wolf predation may still influence prey populations, particularly in combination with environmental factors. Because so few wolves would be on the landscape, fewer localized impacts are expected. Overall, aggressive wolf management philosophies would benefit prey populations across a broader area because wolf predation on prey would be less under this alternative in that fewer wolves would exist on the landscape. Because there would be fewer wolf packs, ungulate monitoring would not be increased.

Other Wildlife. Species such as scavengers that benefit from wolf presence in an ecosystem would not benefit as much from this alternative compared to the others. Those species that may compete with wolves for food or space would be less impacted by this alternative.

Human Environment

Social Factors. Wolf restoration has been a divisive issue among Montanans. Those citizens opposed to wolf presence would benefit the most by this alternative. Citizens who are supportive or neutral may be impacted by the minimal wolf management philosophy. By not taking an adaptive approach, FWP would not meet the differing conservation and management expectations and interests that exist across the spectrum of social values. While Montana citizens would have a stronger voice in wolf management in their state because the program would be administered from a local perspective, FWP would not be able to address all the local interests. In addition, because FWP management flexibility could be constrained by the low wolf numbers, some management decisions may not be entirely satisfactory in light of the need to maintain enough breeding pairs to prevent relisting.

Public Outreach. A significant component of public outreach would consist of working with private landowners to achieve management objectives and to notify them when wolves are in the area. This role would partially be filled by biologists or wardens and partially by information officers distributed around the state. The public outreach to inform landowners and the public about wolf pack activities or whereabouts may increase the public's sense of safety. Significant public outreach may also be required to explain the program and its purposes.

Human Safety. Under this alternative, people would encounter wolves less frequently. There should be fewer encounters between wolves and lion hounds or bird hunting dogs. Other impacts would be the same as Alternative 2 (Updated Council).

Private Property. FWP does not intend to restrict private property uses to manage a recovered wolf population. While wolf use is primarily on public lands, some use of private lands does occur. Use of private lands will increase in the future with increasing wolf numbers, and conflicts may occur more

frequently. Any conflicts on private property would be resolved with aggressive management tools, not incrementally through adaptive management as described under Alternative 2 (Updated Council). In the case of livestock, this would be accomplished either by WS or by the landowner through special kill permits. Management tools would be implemented specifically to discourage wolf use of private property. The economic impacts of wolf-livestock conflicts are addressed below.

Economics / Livelihoods

Livestock Depredation. This alternative predicts that there will be about 154 wolves in Montana in 2015. FWP expects that the historic per wolf depredation rate would be reduced by 75% from the estimate used for Alternative 1 (No Action). Approximately six cattle and seven sheep would be lost annually to confirmed wolf depredation. Four cattle and one sheep could be tallied as probable depredation (Table 39). Losses may be greater in the early years of implementation if more wolves are in the population.

Montana Agricultural Statistics Service (2002) reports that, as of January 1, 2001, the average value of all cattle in Montana was $850 per head. Sheep averaged $94 per head. Purebred lines may, in fact, have a significantly higher value, while other animals may be a lower than average value. The predicted economic loss is $5,758 for confirmed depredation, $3,494 for probable depredation, and $752 for other domestic animals (Table 39). Livestock producers may incur other expenses, including increased management costs due to changes in husbandry practices or materials to improve the physical security of animals. These costs are difficult to estimate and have not been quantified. Presumably, livestock producers already incur some management costs to mitigate for predator losses.

The estimated annual livestock depredation losses for this alternative are small compared to either the statewide value of annual cattle and sheep production or to the level of annual livestock losses to predators other than wolves and to natural causes. But wolf losses are not spread evenly among all Montana livestock producers or shared by the industry as a whole. These losses are borne by individual livestock producers and the losses may in fact, be significant in proportion to the size of the operation. Furthermore, these losses represent a new added risk to some individual livestock producers, depending on where they are geographically located with respect to wolf pack territories.

This alternative does not include a compensation program because landowners and livestock producers are able to aggressively manage situations on their private properties through special kill permits provided by FWP. On public lands, livestock producers could kill a wolf it is attacking, killing, or threatening their livestock. Aggressive management tools should limit livestock depredation to the lowest levels of any alternative. In another sense, this alternative places the highest management burden on private property owners and livestock producers to carry out a significant amount of control work–which is a different type of cost to them.

Big Game Hunting. Same as Alternative 2 (Updated Council).

Regional Economic Activity. Same as Alternative 2 (Updated Council).

Outfitting Industry. Same as Alternative 2 (Updated Council).

Recreational Values.

Hunting Values. Same as Alternative 2 (Updated Council)

Wildlife Viewing and Recreational Trip Values. FWP expects wolf-viewing opportunities to have a positive impact on recreational values in Montana. But at this point, the impact can't be quantified due to a lack of data. For example, it's unknown how changes in the number of wolves affects the odds of seeing wolves or how increasing or decreasing viewing opportunities affect expenditures or net benefits. The addition of wolf viewing should positively impact the recreational values of many citizens and visitors to Montana. The size of the wolf population should be directly related to the positive value accruing to the individuals who value and would seek out wolf viewing or hearing opportunities. As the alternative specifying the lowest recovered population, it would also likely have the least potential to positively impact recreational values of the five alternatives examined.

FWP Fiscal Impacts

Fiscal impacts describe the changes in revenue from license sales, the cost of implementing the program, and the potential sources of revenue to fund it. License revenue from antlerless elk permits, deer B licenses, and moose permits would vary by $220,313 annually, the same as for the other alternatives. FWP's projected budget to implement this alternative is $821,925. FWP would implement this alternative through special federal appropriations, which would be the sole funding source.

Table 40 represents a budget to implement this alternative. It illustrates increased costs to FWP for an intensive wolf monitoring program, the higher administrative costs for increased coordination with adjacent states and USFWS, and increased costs to administer the special kill permit system, and landowner contact. Ungulate monitoring would not be enhanced because so few wolves would be present. WS funding would decrease because private landowners would carry more responsibility. There would be no compensation program. While this budget is FWP's best projection of the resources required, FWP cannot assess its accuracy until the agency actually assumes management authority and implements this alternative. Some components may not be captured fully by this budget. There may also be costs that could not be predicted at this time or were unforeseen.

Table 39. Estimated livestock losses (confirmed and probable) and the economic value of livestock and domestic animal losses in the year 2015 for Alternative 4 (Minimum Wolf). The number of animals is rounded to the nearest whole number.

Type of Loss	Number of Animals Lost	Value per Head[a]	Total Value of Loss
Confirmed Cattle	6	$850	$5,100
Confirmed Sheep	7	$94	$658
		Confirmed Total Value	$5,758
Probable Cattle	4	$850	$3,400
Probable Sheep	1	$94	$94
		Probable Total Value	$3,494
		Total cattle and sheep losses	$9,252
		Estimated Loss of Other Domestic Animals[b]	$752
		TOTAL ESTIMATED ANNUAL LOSS	$10,004

[a] Average value of all sheep and lambs and all cattle, 2001 Montana Agricultural Statistics.
[b] Historically, Defenders of Wildlife compensation payments for other domestic animals (guarding dogs, horses, or llamas) was 8.13% of the total payments for cattle and sheep.

Administration, Funding, and Legal Status

Under this alternative, FWP would be the lead agency, and WS would still be an important cooperator. A great deal of coordination would be required between FWP and WS, Idaho, Wyoming, tribal authorities, NPS, and USFWS. Private landowners would be administering a significant aspect of the program in that their actions will help manage wolf numbers and distribution. This would require greater effort on their part. Individual landowners would make more decisions on how management is implemented in local situations. To that end, landowners' discretionary decisions would significantly influence outcomes. For FWP and WS, many new wolf management activities fall within existing duties and responsibilities already carried out. However, some activities would clearly add to existing responsibilities and workloads. Existing resources would not be adequate.

State laws and FWP administrative rules would guide management and establish the legal framework. The gray wolf would be removed from the state's endangered species list and reclassified as a "species in need of management." Management regulations would be drafted to reflect the aggressive management philosophies described. Even though the gray wolf would be legally protected from an "open season", wolves would be treated differently from how other large carnivores are managed in that the inherent value is not recognized.

Physical Environment

Same as Alternative 1 (No Action).

Short Term, Long Term, and Cumulative Effects

FWP will implement the program, in conjunction with WS, but will be closely supervised by USFWS. Overall, agency flexibility to respond to anticipated and unanticipated situations would be constrained to a large degree because every wolf and pack is a valuable contribution to the Montana population. FWP and WS would also be closely scrutinized by Idaho and Wyoming authorities to ensure that a drop in Montana wolf numbers would not jeopardize the tri-state population.

Wolf numbers will probably increase and so will wolf distribution in the first few years, until control activities bring numbers back down to the delisting level. Localized impacts to prey populations, individual outfitters, or individual businesses may also develop in the short term but are expected to diminish with time. Hunter opportunity will continue to fluctuate. Livestock losses to wolves will still be documented and affect individual producers, but those impacts will be minimal. Landowners and livestock producers would be more closely scrutinized because their participation is a significant part of the program. Licensed hunters and trappers would not be able to regularly participate in wolf conservation and management in Montana.

In the long run, it may not actually be possible to effectively cap wolf numbers and limit wolf distribution. A significant amount of mortality may be required and that level may not be completely achievable or socially acceptable. On the other hand, Montana's portion of the tri-state population could drop below the minimum level, thereby risking the possibility that the species would be listed again and once again managed by USFWS in Montana. In the absence of a proactive program that responds to people and wolves, management efforts may not be efficiently focused or effective. Because the program would be funded strictly by federal money, it may be held to a higher standard and more stringent accountability during USFWS oversight of FWP's federal aid program. All of FWP's matching federal funds could be jeopardized if those standards were not met.

In a cumulative sense, wolf conservation and management in Montana will become increasing controversial because, given the lack of an adaptive approach, not all interests and needs would met in a balanced, responsive way. By managing wolves as close to a legally-defined predator as possible, FWP would ignore a segment of the public that is either supportive or neutral towards wolf presence in Montana and the idea that the gray wolf could be integrated in a modern wildlife program and managed similar to black bears or mountain lions.

Table 40. Implementation budget for Alternative 4 (Minimum Wolf). Asterisk denotes a change from the budget for Alternative 2 (Updated Council).

Division / Activity	Estimated Budget
Montana Fish, Wildlife & Parks	
Wildlife Division (Staff 5.30 FTE)	
Biologists (5.0 FTE)*	$186,895*
Operations*	$195,000*
Enhanced Ungulate Monitoring*	-0-*
Wildlife Lab (.30 FTE)	$ 8,280
Wildlife Lab Operations	$ 7,000
Total	**$397,175**
Enforcement Division (Staff 3.5 FTE)	
Staff (3.5 FTE)*	$ 120,750*
Operations*	$ 90,500*
Total	**$211,250**
Conservation Education Division (Staff 0.75 FTE)	
Information Officer (.50 FTE)	$ 29,000
Headquarters Staff (.25 FTE)	$ 14,500
Operations	$ 6,000
Total	**$ 49,500**
Administration and Finance Division (Staff 1.5 FTE)	
Program Coordination (Hdqtrs/Field) (1.0 FTE)*	$ 54,000*
Support Staff (Hdqtrs/Field)(.50 FTE)*	$ 20,000*
Operations	$ 15,000*
Total	**$ 89,000**
Depredation* (Wildlife Services Cooperative Wolf Damage Management and FWP-directed Predator Control)	**$75,000***
FWP ANNUAL TOTAL	**$821,925**

Mitigation

One of the most significant impacts of this alternative is the risk that the wolf population in Montana would decline to the extent that the tri-state population is in jeopardy and would require renewed protection under ESA. Relisting the northern Rockies population prior to that happening could mitigate the risk so that wolves would be fully protected by federal law, which is more restrictive than the proposed state management program and Montana law. USFWS may consult with FWP to adjust the

program before relisting becomes necessary. Reintroducing wolves from Canada or other adjacent states could augment the Montana population. FWP could also mitigate that impact by modifying specific aspects of how this alternative is implemented. FWP could manage more conservatively or issue fewer permits to private landowners. These same measures would also mitigate for the constraints this alternative places on FWP.

Irretrievable Commitments

In the future, wolves will be present in Montana. FWP would make the commitment to maintain the population. That commitment would be irretrievable in the sense that FWP does not intend to default on its legal responsibilities to maintain a viable, but small population. By assuming the lead role for wolf management, FWP would be committing staff and financial resources to fulfill the needs of the program. Those resources would be partially unavailable to other program areas to the extent that responsibilities don't overlap. Some wolves will still kill livestock. Even though wolves are not expected to have a measurable effect on the livestock industry, a few producers could sustain substantial losses in a given year. The number of depredations will be small, but irretrievable nonetheless.

Alternative 5. Contingency

In order to estimate the environmental consequences, FWP assumed that the proposed reclassification rules proposed by USFWS would be adopted. For comparison, the environmental consequences of this and the other alternatives are presented in a summary at the end of this chapter (Table 43).

Biological Environment

Wolf Management. The consequences would be similar to Alternative 2 (Updated Council). FWP would implement an adaptive program with a 15-breeding pair trigger to move from conservative to liberal tools and vice versa. FWP would have the flexibility to implement most provisions outlined in Alternative 2, but all FWP management options and decisions would be guided by federal regulations until the gray wolf was fully delisted in the northern Rockies. If the wolf population increases at the low rate of growth, liberal management tools would be available in 2006. If the population grew at the higher rate, liberal tools would be available starting in 2004.

The proactive provisions of this alternative would be emphasized to a much greater degree than under Alternative 1 (No Action, USFWS authority). FWP would have more personnel resources from which to draw because personnel are distributed more widely than USFWS personnel. Furthermore, because federal rules are more restrictive about the conditions under which wolves could be harassed or killed, proactive strategies become increasingly more important. Emphasizing proactive strategies earlier on may dampen or avoid future conflicts. Wolves could still be harassed or killed in certain circumstances. Special kill permits will be available to landowners, but the permits would be provisioned according to federal rules. Nonetheless, fewer wolves would probably be harassed or killed under this alternative than for Alternative 2 (Updated Council) because certain provisions of state law allowing defense of property would not be allowed. Defense of property would be guided by federal laws.

Numbers and Distribution. Between 421 and 1,167 (or 35-95 breeding pairs according to the federal definition) could be present in Montana in 2015 under this alternative. FWP expects the population to be closer to the low end of the range, which is fewer than for Alternative 1 (No Action), but more than Alternatives 2, 3 and 4. This result could be expected since not all liberal management tools would be available to FWP until delisting is fully complete. It is possible that there would be fewer wolves if the

population grows more slowly than predicted. The population could be higher if the management tools that FWP could implement didn't slow population growth to the extent assumed for this EIS. This population would be secure and still provide the maximum management flexibility allowed under federal regulations. FWP would not expect the population to drop unexpectedly close to the relisting level, but it will fluctuate through time.

Wolf distribution would be the same as for Alternative 2 (Updated Council).

Wolf Habitat, Connectivity, and Land Management. Same as Alternative 2 (Updated Council).

Monitoring. Same as Alternative 2(Updated Council).

Prey Populations. Same as Alternative 2 (Updated Council). However, in circumstances where reliable data indicate that wolves are disproportionately affecting a local prey population, FWP would not be able to adjust the wolf-prey balance using regulated wolf harvest. Instead, FWP could only use wolf relocation techniques and adjust human hunter opportunity for ungulates to address the situation.

Other Wildlife. Same as Alternative 2 (Updated Council).

Human Environment

Social Factors. In most respects, the consequences of this alternative would be similar to Alternative 2 (Updated Council). One important difference is that the gray wolf would still be listed under ESA. FWP can still implement an adaptive program and respond to the needs of people and wolves in most ways desired. However, FWP could not implement all the management tools that are included in Alternative 2 (Updated Council).

This alternative could be a reasonable interim step in the event that wolf delisting is delayed for an extended period of time. It provides a mechanism for FWP to carry out day to day wolf management. Because it is adaptive, it would allow FWP to meet the differing management expectations and needs that exist across the spectrum of social values. For some citizens, FWP may fulfill these needs and expectations more effectively. Other citizens may not agree, believing that federal authorities alone should manage species listed under ESA. Still others may believe the federal government should manage wolves in perpetuity. This alternative would call on the public to accept the legitimacy of FWP to manage gray wolves while the species is still officially listed under ESA.

Public Outreach. Same as Alternative 2 (Updated Council). Some additional effort would be required initially to inform the public about the rules and regulations, as FWP would be assuming management authority of a listed species from USFWS.

Human Safety. Same as Alternative 1 (No Action). FWP would implement the federal regulations pertaining to defense of human life. Under federal regulations, wolves could be harassed or killed in defense of human life in the presence of an immediate and direct threat. Federal regulations would also permit harassment or lethal control of a wolf if it is a demonstrable, but not immediate threat to human life or safety. There is a 24-hour reporting requirement.

Private Property. Same as Alternative 2 (Updated Council).

Economics / Livelihoods

Livestock Depredation. This alternative predicts that there will be about 421-1,167 wolves in Montana in 2015. FWP expects that a greater emphasis on proactive strategies would reduce the historic depredation rate by 25%, although this is a smaller percentage than Alternative 2 (Updated council) because not all liberal tools would be available. Approximately 49-135 cattle and 55-153 sheep would be lost to confirmed depredation (Table 41). About 29-81 cattle and 5-13 sheep could be lost to probable depredation. The predicted economic loss for confirmed depredation is $46,820 - $129,132. Economic loss due to probable depredation is $25,120 – $70,072. Economic losses for other domestic animals could be $5,849 - $16,195 (Table 41).

Livestock producers may incur other costs, including increased management costs due to changes in husbandry practices or materials to improve the physical security of animals. These costs are difficult to estimate and have not been quantified. Presumably livestock producers already incur some management costs to mitigate for predator loss.

The estimated annual livestock depredation losses for this alternative are small compared to either the statewide value of annual cattle and sheep production or to the level of annual livestock losses to predators other than wolves and to natural causes. But wolf losses are not spread evenly among all Montana livestock producers or shared by the industry as a whole. These losses are borne by individual livestock producers and the losses may in fact, be significant in proportion to the size of the operation. Furthermore, these losses represent a new added risk to some individual livestock producers, depending on where they are geographically in relation to wolf pack territories. Under this alternative, livestock producers have some assurance that Defenders of Wildlife would still provide compensation because the gray wolf would still be listed. However, because the Defenders of Wildlife program is voluntary and funded by private donation, it could be discontinued at any time. FWP would not seek out or develop a substitute, so these losses could go uncompensated if Defenders of Wildlife no longer paid compensation.

Big Game Hunting. Same as Alternative 2 (Updated Council).

Regional Economic Activity. Same as Alternative 2 (Updated Council).

Outfitting Industry. Same as Alternative 2 (Updated Council).

Recreational Values.

Hunting Values. Same as Alternative 1 (No Action), but localized impacts expected to be less.

Wildlife Viewing and Recreational Trip Values. Same as Alternative 2 (Updated Council).

FWP Fiscal Impacts

Fiscal impacts describe the changes in revenue from license sales, the cost of implementing the program, and the potential sources of revenue to fund it. License revenue from antlerless elk permits, deer B licenses, and moose permits could be expected to vary by $220,313 annually, the same as for all alternatives. FWP's projected budget to implement this alternative is $699,046. An additional amount is shown for compensation, but that would be provided independently. FWP would implement this alternative through a combination of federal, private, and state funding. Ninety percent of the total budget would be covered by federal sources. No new FWP revenue would be derived from a regulated wolf harvest.

Table 42 presents a budget for this alternative. FWP anticipates slightly increased administrative costs because of increased coordination with USFWS (not shown) and enhanced ungulate monitoring compared to Alternative 2 (Updated Council). In addition, FWP would dedicate an extra $50,000 to increase technical assistance to landowners for proactive work. Because wolves would still be listed, FWP assumes that WS will continue to be funded directly by Congressional appropriation or through USFWS. While it is FWP's best projection of the resources required, FWP cannot assess its accuracy until the agency actually assumes management authority and begins implementation

Table 41. Estimated livestock losses (confirmed and probable) and the economic value of livestock and domestic animal losses in the year 2015 for Alternative 5 (Contingency). The columns may not sum, due to rounding.

Type of Loss	Number of Animals Lost		Value per Head[a]	Total Value of Loss	
	Low	High		Low	High
Confirmed Cattle	49	135	$850	$41,650	$114,750
Confirmed Sheep	55	153	$94	$5,170	$14,382
Confirmed Total Value				$46,820	$129,132
Probable Cattle	29	81	$850	$24,650	$68,850
Probable Sheep	5	13	$94	$470	$1,222
Probable Total Value				$25,120	$70,072
Total cattle and sheep losses				$71,940	$199,204
Estimated Loss of Other Domestic Animals[b]				$5,849	$16,195
TOTAL ESTIMATED ANNUAL LOSS				$77,789	$215,399

[a] Average value of all sheep and lambs and all cattle, 2001 Montana Agricultural Statistics.
[b] Historically, Defenders of Wildlife compensation payments for other domestic animals (guarding dogs, horses, or llamas) was 8.13% of the total payments for cattle and sheep.

Administration, Funding, and Legal Status

Under this alternative, administrative impacts are similar to Alternative 2 (Updated Council). An important exception is that even though FWP would be the lead agency for day to day management functions and is the primary decision maker, USFWS would oversee the state's implementation. Some elements of the program would be implemented using federal regulations, while others would be implemented using state regulations. That poses some challenges both for FWP, WS, and the public to fully understand all the details. USFWS would still fulfill Section 7 consultations, not FWP.
Many new wolf management activities fall within existing duties and responsibilities already carried out by FWP or WS. But, some activities would clearly add to existing responsibilities and work loads (see Alternative 2). FWP would still dedicate some staff time to coordinate with USFWS, Idaho, and Wyoming to delist the gray wolf in the northern Rockies. In addition, there remains some risk to FWP that federal funds may be difficult to maintain over the long term. FWP may have to decide whether to continue state involvement sometime in the future if state and private sources cannot make up the difference.

Table 42. Implementation budget for Alternative 5 (Contingency). Asterisk denotes a change from the budget for Alternative 2 (Updated Council).

Division / Activity	Estimated Budget
Montana Fish, Wildlife & Parks	
Wildlife Division (Staff 4.30 FTE)	
Biologists (4.0 FTE)	$149,516
Operations	$156,000
Enhanced Ungulate Monitoring*	$75,000*
Wildlife Lab (.30 FTE)	$ 8,280
Wildlife Lab Operations	$ 7,000
Total	**$395,796**
Enforcement Division (Staff 2.5 FTE)	
Staff (2.5 FTE)	$ 86,250
Operations	$ 70,500
Total	**$156,750**
Conservation Education Division (Staff 0.75 FTE)	
Information Officer (.50 FTE)	$ 29,000
Headquarters Staff (.25 FTE)	$ 14,500
Operations	$ 6,000
Total	**$ 49,500**
Administration and Finance Division (Staff .75 FTE)	
Program Coordination (Hdqtrs/Field) (.5 FTE)	$ 27,000
Support Staff (Hdqtrs/Field)(.25 FTE)*	$ 10,000
Operations	$ 10,000
Total	**$ 47,000**
Proactive, preventative efforts by FWP, Wildlife Services, or others	**$50,000**
FWP ANNUAL TOTAL	**$699,046**
Depredation* (Wildlife Services Cooperative Wolf Damage Management and FWP-directed Predator Control); source is federal appropriation	**$50,000**
Compensation, Private Source	**$77,789 – 215,399**
PROGRAM TOTAL (Including Compensation)	**$776,835 – 914,445**

Physical Environment

Same as Alternative 1 (No Action).

Short Term, Long Term, and Cumulative Effects

In the short term, this alternative could serve as a bridge between federal and state authority. Despite USFWS oversight, FWP would be implementing the program and state personnel would gain knowledge and experience prior to assuming full responsibility. There could be some confusion in the public's

understanding of the roles and responsibilities of the state and federal agencies because the state would be assuming management of a listed species. While there are some limitations to what FWP could do, FWP would still have latitude to implement much of the program, especially the proactive elements. In so doing, the program is more responsive both in the short and long term. Wolf numbers will probably increase and so will wolf distribution. Localized impacts to prey populations, individual outfitters, or individual businesses may also develop in the short term. Hunter opportunity will still continue to fluctuate for a variety of reasons, which may include wolf predation. Livestock losses will still affect individual producers.

In a cumulative sense, FWP would be stepping into a controversial arena. For some citizens, wolf acceptance would be improved because management would be through a state agency, adaptive principles would make for a more flexible program than currently exists, and the program would balance the needs of people and wolves. For other citizens, wolf acceptance may even decrease because the state would manage a listed species that had achieved the biological recovery requirements but was still listed under ESA. Public debate surrounding wolf conservation will probably remain conflicted because the national scope will be maintained because the species would still be listed.

Mitigation

Mitigation measures for this alternative are similar to Alternative 2 (Updated Council). An increased public outreach effort can mitigate public confusion over agency roles and responsibilities, the management framework, and uncertainty about the laws and regulations.

Irretrievable Commitments

Wolves will be present in Montana. Under this alternative, FWP would make a commitment to conserve and manage the species and integrate it within the wildlife program. In the short term, that integration may not be complete since federal regulations guide some elements of the program. However, in the long term once the wolf is delisted, FWP's commitment would be irretrievable in the sense that FWP does not intend to default on its legal responsibilities to maintain a secure viable population in the future. FWP would be committing staff and financial resources to fulfill the needs of the program. Those resources would be partially unavailable to other program areas to the extent that responsibilities and activities don't overlap. FWP would be taking the risk that federal funding would be secure, adequate, and would not diminish prior to full delisting. FWP would also make the commitment to conserve and manage the gray wolf, no matter the outcome of the delisting process – whether delays are short term or long term.

The adaptive management tools within this alternative will mitigate many potentially irretrievable commitments of resources or changes in resource status. However, some wolves will kill livestock and those losses are irretrievable.

Table 43. Summary of environmental consequences for each alternative.

Issue	1. No Action	2. Updated Council	3. Additional Wolf	4. Minimum Wolf	5. Contingency
Wolf Management	Recovery emphasis; increase population size and distribution; address conflicts	Adaptive; responsive; balanced; FWP has flexibility; gray wolf integrated into wildlife program; resolve conflicts	Same as Alternative 2; more management flexibility because more wolves	Not adaptive; aggressive; liberal; more control done by landowners; FWP has limited flexibility	Same as Alternative 2 but not all tools available while gray wolf still listed (no regulated harvest)
Number of Wolves in 2015	854 wolves or 70 breeding pairs	LOW: 328 wolves or 27 breeding pairs; liberal tools start in 2006 HIGH: 657 wolves or 54 breeding pairs; liberal tools start in 2004	LOW: 365 or 30 breeding pairs; liberal tools start in 2008 HIGH: 807 or 66 breeding pairs; liberal tools start in 2006	CAP: 154 or 13 breeding pairs; aggressive management upon delisting until population reduced to cap	LOW: 421 or 35 breeding pairs; liberal tools start in 2006; no regulated harvest HIGH: 1,167 or 95 breeding pairs; liberal tools start in 2004; no regulated harvest
Wolf Distribution in 2015	Statewide is possible, but will ultimately be determined by prey abundance and conflicts with people in practical terms; expected to be western, west-central, and southwestern Montana	Statewide is possible, but will probably be primarily western, west central and southwestern Montana; no administrative zone, but encouraged on remote public lands and integrated in mixed landowner-ships; localized distribution will be determined by prey abundance and conflicts with people	Same as Alternative 2	Public lands in western Montana; administrative zone defined by FWP regional boundaries; no wolves east of FWP Region's 4 and 5 boundaries; management to restrict wolf use of private lands; localized distribution will be determined by prey abundance and conflicts	Same as Alternative 2
Wolf Habitat, Connectivity, Land Management	Connectivity assured through legal protection and adequate prey and wolf numbers	Connectivity assured through legal protection and adequate prey and wolf numbers	Connectivity slightly increased over Alternative 2	Connectivity not assured without periodic wolf trap/relocation efforts	Same as Alternative 2
Monitoring	Moderate, declining intensity; done by USFWS	Moderate cost and intensity; done by FWP	Same as Alternative 2	High cost and intensity; done by FWP; strong reliance on telemetry	Same as Alternative 2

Table 43. Continued.

Issue	1. No Action	2. Updated Council	3. Additional Wolf	4. Minimum Wolf	5. Contingency
Prey Populations	Management not fully integrated with wolves; numbers fluctuate through time because of predation (all species), natural mortality, human hunting, habitat conditions, weather events; fluctuation similar to historical patterns; local ungulate populations may decrease in presence of wolves; local populations may take longer to recover from environmental events in the presence of wolves	Management integrated with wolves and managed ecologically; local populations may decrease in presence of wolves or take longer to recover from environmental events; local impacts expected to be less than Alternative 1; impacts across broad geographic areas not expected; numbers will fluctuate through time due to predation (all causes), natural mortality, human hunting, habitat conditions, weather events; fluctuation similar to historical patterns	Same as Alternative 2	Same as Alternative 2, but no impacts to localized ungulate populations expected	Same as Alternative 2; no regulated wolf harvest to help balance wolf-prey relationships; wolf management tools primarily relocation
Other Wildlife	Some species may be impacted; other species benefit	Same as Alternative 1; FWP better able to address needs of other wildlife species	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Social	Variable	Variable	Variable	Variable	Variable
Public Outreach	Less effort than Alternatives 2, 3 and 5	Increased from Alternative 1; statewide effort (general ecology, safety, landowner contacts, etc.); many types	Same as Alternative 2	Emphasizes landowner contacts	Same as Alternative 2
Human Safety	Defense of human life under ESA acceptable; report within 24 hours; USFWS management to remove threats to public safety	Defense of human life acceptable under Montana law; FWP management to remove threats to public safety	Same as Alternative 2	Same as Alternative 2	Same as Alternative 1; FWP implements federal regulations
Private Property	No restrictions by USFWS	No restrictions by State of Montana	Same as Alternative 2	Wolf use discouraged; same as Alternative 2	Same as Alternative 2
Livestock Depredation	Confirmed Cattle: 132 Confirmed Sheep: 150 Probable Cattle: 79 Probable Sheep: 13	Confirmed Cattle: 25-51 Confirmed Sheep: 29-58 Probable Cattle: 16-31 Probable Sheep: 3-5	Confirmed Cattle: 28-62 Confirmed Sheep: 32-71 Probable Cattle: 17-38 Probable Sheep: 3-6	Confirmed Cattle: 6 Confirmed Sheep: 7 Probable Cattle: 4 Probable Sheep: 1	Confirmed Cattle: 49-135 Confirmed Sheep: 55-153 Probable Cattle: 29-81 Probable Sheep: 5-13

Table 43. Continued.

Issue	1. No Action	2. Updated Council	3. Additional Wolf	4. Minimum Wolf	5. Contingency
Compensation	Privately funded, voluntary; Defenders of Wildlife possible Confirmed: $126,300 Probable: $68,372 Other Domestic: $15,827	FWP establishes an independent entity; no state or matching dollars are used; mitigation through management possible Confirmed: $23,976-$48,802 Probable: $13,882-$26,820 Other Domestic: $3,077-$6,148	No effort by FWP to establish program; private and voluntary OK; no state or matching federal dollars; mitigation possible Confirmed: $26,808-$59,374 Probable: $14,732-$32,864 Other Domestic: $3,377-$7,498	None Confirmed: $5,758 Probable: $3,494 Other Domestic: $752	Same as Alternative 2 Confirmed: $48,820-$129,132 Probable: $25,120-$70,072 Other Domestic: $5,849-$16,195
Big Game Hunting	No impact for non-residents; resident opportunity variable through time; changes not expected to be greater than observed historically; impacts localized; decreases or increases possible due to wolf presence or other management objectives; no mitigation	No impact to non-residents; resident opportunity variable through time; changes not expected to be greater than observed historically; impacts localized, but less severe than Alternative 1 because ungulate management is integrated with wolf management; increases possible due to wolf presence or other management objectives; mitigation possible	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Regional Economy	No regional or statewide impact; localized possible	Same as Alternative 1; localized changes expected to be less than Alternative 1	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Outfitting Industry	No impact statewide or regionally; impacts to certain outfitters possible where wolves affect local prey populations; no mitigation	Same as Alternative 1; localized impacts expected to be less than Alternative1	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Recreational Values (Hunting and Wildlife Viewing)	Variable	Variable	Variable	Variable	Variable

Table 43. Continued.

Issue	1. No Action	2. Updated Council	3. Additional Wolf	4. Minimum Wolf	5. Contingency
FWP Fiscal	Minor impact due to historic changes in license revenue FWP: up to $5,000 for coordination; costs absorbed in existing budget USFWS $1,111,000 -- total for Montana, Idaho, and Wyoming combined WS: all federal appropriation	Minor impact due to historic changes in license revenue; funding shared by federal, state, and private sources; some revenue generated if implement regulated wolf harvest FWP: $774,046; combination of FWP, federal, and private; extra $50,000 for preventative work included; $100,000 for WS included; compensation not included	Same as Alternative 2 FWP: $799,046; combination of FWP, federal, private; extra $50,000 for preventative work included; $50,000 for WS included; compensation not included	Same as Alternative 1; funding by federal sources; inconsistent revenue from wolf license sales FWP: $821,925 all federal; no extra $$ for preventative work; $75,000 for WS included	Minor impact due to historic changes in license revenue; 90% funding federal; state share out of existing budget; no new revenue generated by wolf license sales FWP: $699,046; cost share 90% federal: 10% state until wolf delisted and authority transferred completely; upon delisting, combination of FWP, federal, and private; extra $50,000 for preventative work included; compensation not included WS: all federal appropriation, separate
Administration, Funding, and Legal Status	Still listed; "endangered" and "experimental / non-essential"; USFWS and partners; federal laws	Delisted; state laws; "species in need of management"; FWP and WS;	Same as Alternative 2	Delisted; state laws; "species in need of management" but managed aggressively as if it was a "predator"; FWP and WS	Still listed; "endangered" and "experimental / non-essential"; state laws for most things but federal regulations for activities resulting in wolf harassment, injury or death; FWP and WS with USFWS oversight
Physical Environment	No Impact	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

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Individuals involved with the Montana Wolf Management Advisory Council:

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GLOSSARY OF TERMS AND ABBREVIATIONS

adaptive management: a model for wolf conservation and management in which the number of wolf packs determines the appropriate management strategies; changes in the number of packs determined through a monitoring program directs selection of more conservative or liberal management strategies; model incorporates resource objectives, monitoring protocols, evaluation of predicted outcomes, and a decision process

aggression: dominance behavior typical of canid species demonstrated towards humans

BLM: U.S. Bureau of Land Management

breeding pair: at least two adult wolves with at least two pups that survive to December 31; the number of breeding pairs are tabulated and used to measure progress towards the USFWS recovery goal for the gray wolf in the northern Rockies

CITES: Convention on International Trade in Endangered Species

compensation: monetary payment to offset or replace the economic loss for a death or injury to livestock or guarding animals due to wolf activity; may also entail financial assistance to livestock producers to offset costs associated with modification to husbandry practices to minimize the potential for wolf-livestock conflicts

confirmed depredation: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; depredation is *confirmed* in cases where there is reasonable physical evidence that an animal was actually attacked and/or killed by a wolf. The primary confirmation would ordinarily be the presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the attack occurred while the victim was alive, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh tracks, scat, hairs rubbed off on fences or brush, and/or eye witness accounts of the attack may help identify the specific species or individual responsible for the depredation. Predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e. if much of the carcass has already been consumed by the predator or scavengers) **if** there is other physical evidence to confirm predation on the live animal. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other victims for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed predation on the animal that has been largely consumed

Council: Montana Wolf Management Advisory Council

defense of life/property: release from criminal liability for killing or injuring a wolf if the wolf is attacking, killing, or threatening to kill a person, livestock, or a domestic dog (MCA 87-3-130)

delisting: removal of the gray wolf from the list of "threatened or endangered" species that are managed by the U.S. Fish and Wildlife Service under the Endangered Species Act; delisting requires evaluation of current status of species compared to the delisting criteria with regard to habitat, over utilization, disease/predation, existing regulatory mechanisms, and other factors affecting the continued existence of the species; if the current status is secure in each of the 5 categories and the recovery criteria are met, a species is delisted and managed by the state or tribal fish and wildlife management authority

depredation: incident where livestock or guarding animals are injured or killed

draft EIS: draft environmental impact statement identifying alternatives and environmental consequences

final EIS: final environmental impact statement; must include a summary of the major conclusions and supporting information from the draft environmental impact statement and the agency's responses to substantive comments received on the draft

EIS: environmental impact statement

ESA: Endangered Species Act

FWP: Montana Fish, Wildlife & Parks

GNP: Glacier National Park

GYA: Greater Yellowstone Area

habituation: readily visible in close proximity to people or structures on a regular basis; not threatened by close proximity and may even be attracted to human presence or human food sources; extremely rare behavior in wild wolves, but typical behavior for released captive wolf or wolf-dog hybrid; for wolves, may or may not involve food conditioning

illegal mortality: wolf mortality outside the provisions of a special kill permit, defense of life or property, agency management actions, a MFWP Commission approved season, or outside other regulations established for the gray wolf as a legally classified "species in need of management"

guarding animals: domestic animals (dogs, llamas etc.) that escort livestock to decrease likelihood of a depredation incident by aggressively defending livestock in the presence of wolves or other predators

legal mortality: lethal control or mortality of a wolf within the provisions of a special kill permit, defense of life or property, agency management actions, a MFWP Commission-approved season, or the regulations established for the gray wolf as a legally classified "species in need of management"

lethal control: management actions that result in the death of a wolf

livestock: cattle, calf, hog, pig, horse, mule, sheep, lamb, goat, guarding animals, emu, ostrich, poultry

management setting: the combination of landownership patterns, land use, social factors, biological constraints, and physical attributes of the environment that describe a particular area or management situation

management: the collection and application of biological information for the purposes of increasing the number of individuals within species and populations of wildlife, up to the optimum carrying capacity of their habitat, and maintaining such levels. The term includes the entire range of activities that constitute a modern scientific resource program including but not limited to research, census, law enforcement, habitat improvement, and education. Also included within the term, when and where appropriate, is the periodic or total protection of species or populations as well as regulated taking (MCA 87-5-102)

MCA: Montana Codes Annotated

MDOL: Montana Department of Livestock

mixed landownership: patterns of land ownership where privately owned lands are intermingled with public lands and/or corporate-owned lands; sometimes called a "checkerboard pattern"

MEPA: Montana Environmental Policy Act

MOU: Memorandum of Understanding

NPS: U.S. National Park Service

non-lethal control: a variety of management activities intended to avert or resolve a conflict situation without killing the wolf or wolves in question; examples include non lethal harassment to disrupt or interrupt wolf behaviors, frightening a wolf, monitoring of wolf location using radio telemetry, or relocation

non-lethal harassment: an example of non-lethal control where a wolf is frightened or threatened, but is not mortally wounded or killed; purpose is to discourage wolf activity
near people or livestock; examples yelling, radio-activated noise-makers, or firearms which discharge cracker shells

pack: used generically to mean a group of wolves holding a territory and capable of reproduction; more specific definitions are social group and breeding pair

probable depredation: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; having some evidence to suggest possible predation, but lacking sufficient evidence to **clearly** confirm predation by a particular species, a kill may be classified as *probable* depending on a number of other factors such as (1) has there been any recently confirmed predation by the suspected depredating species in the same or nearby area? (2) How recently had the livestock owner or his employees observed the livestock? (3) Is there evidence (telemetry monitoring data, sightings, howling, fresh tracks etc.) to suggest that the suspected depredating species may have been in the area when the depredation occurred? All of these factors, and possibly others, should be considered in the investigator's best professional judgment.

problem wolf: wolf that has attacked livestock, or is a nuisance animal that could potentially compromise human safety

public safety problem or threat: any situation where the continued presence of a carnivore poses a threat to human safety; or, an attack has resulted in the loss of livestock or personal pets; or a human has been physically injured or killed

ROD: record of decision, sometimes called a decision document; a concise public notice that announces a state agency decision arrived at through the Montana Environmental Policy Act, explains the reasons for the decision, and explains any special conditions surrounding the decision or its implementation

regulated public harvest: category of legal of wolf mortality where wolves are killed under FWP Commission-approved seasons and regulations by licensed hunters or trappers; total harvest strictly controlled through permit or quota system; law enforcement as for other managed species

recovery goal: a total of 30 breeding pairs with equitable distribution throughout Montana, Idaho, and Wyoming for three successive years; breeding pair is defined as at least two adult wolves with at least two pups that survive to December 31; when the *recovery goal* is met, the U.S. Fish and Wildlife Service could initiate the process to remove the gray wolf from the list of threatened and endangered species protected by the Endangered Species Act

relisting: placing the a species back on the federal list of threatened or endangered species protected by the Endangered Species Act; relisting criteria may or may not be similar to delisting criteria; relisting requires evaluation of current status of species compared to criteria with regard to habitat, over utilization, disease/predation, existing regulatory mechanisms, and other factors affecting the continued existence of the species; if current status is not secure with regard to the 5 areas, a species may be relisted.

remove: to place in captivity or to kill under controlled conditions or in a controlled setting determined by management authorities

SB163: Senate Bill 163, Reclassify Certain Species for Management Purposes, passed during the 2001 session of the Montana Legislature and signed into law by Governor Martz

social group: a more specific definition of a wolf pack; in this document social group is defined as four or more wolves traveling in winter which is holding a territory and capable of reproduction

special kill permit: written authorization granted to a property owner by Montana Fish, Wildlife & Parks to kill or destroy a specified number of animals causing damage to private property; permits are only valid under a specific set of conditions or criteria

species in need of management: legal classification of nongame species that are designated by Montana Fish, Wildlife & Parks as needing special management regulations; Montana Fish, Wildlife & Parks, by regulation, establishes the limitations relating to taking, possession, transportation, exportation, processing, sale or offer for sale, or shipment considered necessary to manage nongame wildlife; Except as provided in regulations issued by the Department, it is unlawful for any person to take, possess, transport, export, sell, or offer for sale species designated by Montana Fish, Wildlife & Parks as "in need of management" (MCA 87-5-104 to 87-5-106)

take: to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife

tri-state area: states of Montana, Idaho, and Wyoming, making up the northern Rockies wolf recovery area

unconfirmed: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; lacking sufficient evidence to classify an incident as depredation in contrast to other possible causes of death, it is classified as *unconfirmed*; it is unclear what the cause of death may have been. The investigator may or may not have much of a carcass remaining for inspection, or the carcass may have deteriorated so as to be of no use; in the context of wolf management, cause of death is attributed to a cause other than wolf predation

undocumented loss: livestock losses for which there is no apparent explanation for the loss; usually in the context of a numerical discrepancy between the number of livestock head at the beginning of the grazing season and what is retrieved at the end of the grazing season; evidence documenting a death is usually not found

USFS: U.S. Forest Service

USFWS: U.S. Fish and Wildlife Service

WMA: Montana Fish, Wildlife & Parks Wildlife Management Area

wolf-human conflict: where a public safety problem develops; a situation where an MFWP employee reasonably determines that the continued presence poses a threat to human safety, an attack has resulted in the loss of livestock or personal pets, or that a human has been physically injured or killed.

wolf-livestock conflict: where a wolf or wolves are loitering, testing, worrying, or otherwise disrupting livestock; also, a situation where a wolf is suspected to have killed or injured livestock or guarding animals

worrying: to disrupt, cause anxiety, make uneasy, or harass repeatedly or over a period of time; also, to seize, especially by the throat, with the teeth and shake or mangle

WS: U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services; federal work unit with responsibility to address and resolve damage caused by wildlife; examples include bird concentrations at airports or depredation on livestock

YNP: Yellowstone National Park

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APPENDIX 1

MONTANA WOLF CONSERVATION AND MANAGEMENT PLANNING DOCUMENT

DRAFT

PREPARED IN RESPONSE TO THE MONTANA WOLF MANAGEMENT ADVISORY COUNCIL RECOMMENDATIONS

JANUARY 2002

EXECUTIVE SUMMARY

The State of Montana recognizes the gray wolf as a native species and will integrate wolves as a valuable part of our wildlife heritage. Since 1973, the U.S. Fish and Wildlife Service (USFWS) has managed wolves as an endangered species in Montana, under the authority of the Endangered Species Act (ESA). Wolves are likely to be removed from the endangered species list within 3-5 years. Upon delisting, management authority for wolves will return to Montana Fish, Wildlife & Parks (MFWP). MFWP recognizes and accepts the challenges, responsibilities, and benefits of a restored wolf population. Managing gray wolves will not be easy, but wolf restoration is fundamentally consistent with Montana's history of wildlife conservation. Long-term persistence of wolves in Montana depends on carefully balancing the complex biological, social, economic, and political aspects of wolf management.

State laws and administrative rules become the primary regulatory and legal mechanisms guiding management. Upon delisting, the gray wolf will automatically be classified as a species "in need of management." MFWP and the MFWP Commission will establish the regulatory framework to manage the species thereafter. This Plan provides the foundation for wolf conservation and management upon delisting and describes a spectrum of management activities that maintain viable populations of wolves and their prey, resolve wolf-human and wolf-livestock conflicts, and gain the support of people with diverse interests. Much of it is based on the comments and recommendations of a diverse 12-member citizens group, the Montana Wolf Management Advisory Council, and an Interagency Technical Committee. MFWP intends to honor the diverse perspectives and interests of our citizens and the national public. The State will consider a spectrum of interests in designing and implementing a balanced, responsive program that recognizes the opportunities and addresses the challenges faced by people directly affected by wolves.

Wolves will be integrated and sustained in suitable habitats within complex management settings. The wolf program will be based on principles of adaptive management. Management strategies and conflict resolution tools will be more conservative as the number of packs decreases, approaching the legal minimum. In contrast, management strategies become more liberal as the number of packs increases. Ultimately, the status of the wolf population itself identifies the appropriate management strategies. Fifteen packs will be used as the trigger to change management, not as a minimum or maximum number of wolves "allowed" in Montana. MFWP does not administratively declare an upper limit or maximum number of individuals of any wildlife species in the state in the sense of a "cap." Instead, MFWP identifies population objectives that are based on landowner tolerance, habitat conditions, social factors, and biological considerations. Wildlife populations are then managed according to the objectives and current population status, using an array management tools.

Wolf distribution in Montana, as for other species, will ultimately be defined by the interaction of the species ecological requirements and human tolerance, not through artificial delineations that are administratively determined. Social acceptance of wolves transcends the boundaries of geography, land ownership, or land use designations just like a wolf pack territory boundary physically transcends them, too. An adaptive approach will help MFWP implement its wolf program over the range of social acceptance values now and in the future. Sensitivity towards and prompt resolution of conflict where and when it develops is an important condition of not administratively capping wolf numbers or defining distribution.

Ultimately, wolf distribution will probably encompass western Montana because of the predominance of public lands as compared to eastern Montana. Wolves will be encouraged on large contiguous blocks of public land, managed primarily as backcountry areas or national parks where there is the least potential for conflict, particularly with livestock. Wolf packs in areas of interspersed public and private lands will be managed in ways similar to other free-ranging wildlife in Montana and within the constraints of the biological and social characteristics, the physical attributes of the environment, land ownership, and land uses. Some agency discretion and flexibility will be exercised by necessity to accommodate the unique attributes of each pack, its history, the site-specific characteristics of its home range, landowner preferences, or other factors that cannot be reasonably predicted at this time. Management flexibility will be crucial in addressing all of the public interests that surround wolves.

On a broad scale, ungulate distribution and human settlement patterns largely define wolf habitat. MFWP ungulate programs link habitat and population management through sustained public hunting to achieve ungulate population objectives. In this way, MFWP takes an important habitat need of wolves into consideration. Our work, along with

the amount of land held in public ownership and adequate legal protections, provides long-term habitat availability for wolves. Federal land management agencies are increasingly managing lands from an ecosystem-level perspective, considering all components and functional relationships. Yellowstone and Glacier national parks function as refuges at opposite ends of the geographic extent of wolf distribution in the northern Rockies. The network of public lands in western Montana, central Idaho, and northwest Wyoming facilitates connectivity between the sub-populations. The legal protections and public outreach described in this plan help ensure the integrity of wolf movement and occupancy of habitats between refuges.

Wolf population management will include the full range of tools from non-lethal to lethal and will incorporate public outreach, conservation education, law enforcement, and landowner relations. Wolves do not exist in isolation from their environment, nor should an effective management program isolate wolves from their environment. Management actions will be evaluated in light of prevailing conditions or extenuating circumstances. Wolf populations will fluctuate as a result of management actions, natural mortality, legal harvest, illegal take, wolf productivity, and ungulate population fluctuations. If there are fewer than 15 wolf packs in the state, management tools are primarily non-lethal, particularly in backcountry settings and for public lands near national parks. Examples of non-lethal techniques include monitoring wolf locations using radio telemetry, changes in livestock husbandry practices, harassment, relocation, or attempts to modify wolf behavior. A minimum of 15 packs is required to use more liberal management tools, including lethal methods to resolve wolf-livestock, wolf-human conflicts, or concern over a localized prey population in light of the combined effects of predation and environmental factors.

When the wolf population no longer fits the definition of a species "in need of management" or when wolf numbers have increased and population regulation is needed, the MFWP Commission may reclassify the wolf as a big game animal or a furbearer. Regulated public harvest of wolves by hunting and trapping during designated seasons is one tool that may help MFWP manage wolf numbers. Through public input and MFWP Commission oversight, harvest regulations would describe legal means of take, license requirements, and reporting and tagging requirements. Total harvest would be strictly controlled through a permit or quota system, with season closures as soon as harvest objectives are reached. Regulated harvest of wolves would take place within the larger context of multi-species management programs. As wolf numbers increase and distribution expands, harvest opportunity would increase. Specific harvest objectives will depend on other losses to the wolf population, such as control actions for livestock depredation or loss of a pack because of intraspecific strife. Wolves could be promoted (on remote public lands) or discouraged (in areas with high livestock densities) depending on harvest objectives, district boundaries, and pack distribution. Hunting is not permitted in national parks. Harvest management would proceed adaptively, but all hunting and trapping is precluded if wolf packs totaled fewer than 15. Law enforcement by the MFWP Enforcement Division would also proceed similar to other legally classified wildlife species.

The primary wolf monitoring responsibilities will rest with MFWP. We will estimate wolf numbers and pack distribution, document reproduction, and tabulate mortality. Ecological understanding will also stem from documenting territory boundaries, the locations of wolf den and rendezvous sites, and identifying key prey species and foraging areas during winter and spring seasons. The monitoring program will balance scientific precision with cost effectiveness. We will use a combination of radio telemetry and non-invasive techniques.

Because of their long-term financial investments and willingness to restrict themselves when necessary, Montanans enjoy relatively liberal hunting seasons for more ungulate species than other western states. The financial investments and sacrifices made by the hunting public to restore ungulate populations are significant. Safeguarding those investments for present and future generations is an important priority for many of Montana's citizens and MFWP. MFWP seeks to maintain the public's opportunity to hunt a wide variety of species under a variety of circumstances, and to do so in a sustainable, responsible manner.

To proactively balance and integrate management of ungulate populations and the factors that influence them (including wolf predation), hunter harvest opportunity for ungulates may be adjusted. Hunter opportunity already changes in response to previous hunter success, hunter participation rates, access to private lands, or environmental events such as drought or severe winters. The presence of wolves within the yearlong range of a specific ungulate herd adds another factor for consideration among all environmental and human-related factors. MFWP acknowledges that changes in hunter opportunity may affect outfitters and non-resident hunters, in addition to resident hunters. If a local prey population is significantly impacted by wolf predation in conjunction with other

environmental factors, MFWP would consider reducing wolf pack size. Wolf management actions would be paired with other corrective management actions to reduce ungulate mortality or enhance recruitment. Concurrent management efforts for wolves and ungulates would continue until the prey population rebounded, recognizing that by the time prey populations begin to respond they may be influenced by a new set of environmental factors.

MFWP regularly surveys ungulate populations across a spectrum of their habitats. Information gathered from live populations is also supplemented by harvest information gathered at hunter check stations or through the telephone harvest survey. Ungulate monitoring efforts will be enhanced where wolf packs are established.

MFWP will share responsibility with Montana Department of Livestock(MDOL) in managing wolf-livestock conflicts because Montana statutes assign responsibility to both agencies to manage wildlife causing damage to livestock. Wolves can create problems for some livestock producers. Financial losses may result directly from wolf depredation. Indirect costs may accumulate because of increased management activities, changes in husbandry practices, or uncompensated losses. These financial hardships accrue to individual farmers and ranchers and may be significant to them. Addressing wolf-livestock conflicts will entail two separate, but parallel elements. One element is the wolf management activities carried out by Wildlife Services (WS) and MFWP to minimize the potential for wolf-livestock conflicts and to resolve the conflicts where and when they develop. Examples are providing technical assistance, investigating complaints, and taking actions that reduce the probability that the offending wolf or wolves will be involved in another depredation incident. The management programs will be funded, administered, and implemented by the cooperating agencies. The second element addresses the economic losses through a compensation program when livestock are killed or injured by wolves.

The two elements, management and compensation, are funded, administered, and implemented separately and independently of one another -- but parallel one another, united in the goal of maintaining a viable wolf population and addressing wolf-livestock conflicts. MFWP and MDOL will work together, along with WS, to address and resolve wolf-livestock conflicts through a Memorandum of Understanding (MOU). MFWP, in cooperation with MDOL, will contract WS to respond to landowner or livestock producer wolf depredation complaints, to conduct field investigations, and to carry out management actions. MFWP has the ultimate responsibility for determining the disposition of wolves.

Livestock producers should report any suspected wolf depredations (injuries or death) or the disruption of livestock or guarding animals to WS directly. If the investigating WS agent *confirms* that a wolf or wolves were responsible, subsequent management actions will be guided by the specific recommendations of the investigator, the provisions of this plan and by the multi-agency MOU. WS will be directed to take an incremental approach to address wolf depredations, guided by wolf numbers, depredation history, and the location of the incident. When wolf numbers are low and incidents take place on remote public lands, WS would use more conservative management tools. WS could apply progressively more liberal methods as wolf numbers increase and for incidents on private lands. Conflict history of the pack, attributes of the pack (e.g. size or reproductive status), or the physical setting will all be considered before a management response is selected. Management actions will be directed at individual problem wolves. Non-selective methods such as poison would not be used.

MFWP may also approve lethal removal of the offending animal by livestock owners or their agents. A special kill permit (issued by MFWP) is required for lethal control of any legally classified wildlife in Montana, outside the defense of life/property provision or MFWP Commission approved regulations. MFWP will not issue special kill permits to livestock producers to remove wolves on public lands when wolf numbers are low. If the number of wolf packs was at 15 or greater, MFWP may issue a special kill permit to livestock producers that would be valid for public and private lands. MFWP will be more liberal in the number of special kill permits granted as wolf numbers increase and for depredations in mixed land ownership patterns.

In a proactive manner, WS and MFWP will also work cooperatively with livestock producers and non-governmental organizations to help minimize the potential of wolf-livestock conflicts developing in the first place. Beyond technical assistance fro WS or MFWP and other collaborative efforts, livestock producers (or their agents) may non-lethally harass wolves when they are close to livestock on public or private lands. Private citizens may also non-lethally harass wolves that come close to homes, domestic pets, or people. Upon delisting, private citizens could kill a wolf if it is threatening human life or domestic dogs. Livestock producers or their agents could also kill a wolf if it

is attacking, killing, or threatening to kill livestock. This is consistent with Montana statutes that permit private citizens to defend life or property from imminent danger caused by wildlife.

Montana recognizes that wolf population recovery and persistence will result in the loss of personal property or income due to wolf activity and depredation. Compensation is critical to maintaining tolerance for wolves by livestock producers who are adversely affected by financial losses due to wolves. Montana would like to maintain and enhance the benefits of the compensation program. But compensation payments cannot be made from MFWP funds or matching federal funds intended for wildlife or habitat programs. The State of Montana intends to find or create an entity to administer a compensation program if Defenders of Wildlife rescinds eligibility of Montana ranchers upon delisting. The entity or non-governmental organization would be independent of MFWP and MDOL to retain impartiality and the terms and negotiations take place directly with the producer. Agency decision-making on the disposition of the problem animal is independent of the outcomes of the compensation negotiations. Producers would be compensated for *confirmed* and *probable* livestock losses at fair market value at the time of death and at fall value for young of the year. Eligible livestock include cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, and guarding animals. Despite the present uncertainty of how a compensation program would be designed and administered, securing adequate funding for compensation is of equal priority as securing funding to implement the other state and federal agency management activities described in this plan.

Generally, wolves fear people and do not pose a significant threat to human safety. However, in extremely rare cases, individual wolves may gradually lose their fear of people and begin associating or interacting with people and/or loitering near buildings, livestock, or domestic dogs. While this behavior is extremely unusual for a wild wolf, it is more typical of a released captive wolf or wolf-dog hybrid. MFWP intends to reduce the potential for wolf-human conflicts and minimize the risks of human injury due to any large-sized canid. MFWP will utilize extensive outreach to inform the public, discourage habituation, and then respond to conflicts where and when they develop.

If a wolf (or similar large canid) loiters near ranch buildings or rural residences, MFWP will evaluate the potential risk to human safety, taking into account the setting, behavior of the animal, and the sequence of events. Across the spectrum of wolf distribution and numbers, MFWP will take an incremental approach. Potential actions include: increasing contacts within the local community, closely monitoring the situation, marking the animal with a radio collar to track its movements, aversive or disruptive conditioning, harassment, relocation, or lethal removal. A wolf could move through these areas, but length of stay and behavior will be important criteria for determining the appropriate management response. MFWP will require some degree of flexibility to be most responsive to public safety concerns. Although the management responsibility related to wildlife and human safety rests with MFWP, local law enforcement or other state of federal agency personnel may respond to a wolf-human incident if MFWP personnel are not available in a timely manner. In the unlikely need for defense of human life during a wolf encounter, citizens may use any means, including lethal force, to address an imminent threat.

MFWP will provide information to the general public about appropriate responses during wolf encounters (do's and don'ts) and how to minimize the potential for problems near homes and rural schools. This material will also include information about wolf behavior, body posture, tail position, vocalizations, etc. to help the public evaluate the situation, correctly interpret wolf behavior, and communicate the details accurately to agency personnel. An educational effort will also help the public understand the differences between wolves, mountain lions, and bears in terms of animal behaviors, potential risk of injury, appropriate human responses when threatened, and how to live and recreate outdoors in the presence of these large carnivores.

A successful conservation and management program for wolves ultimately depends on people and their attitudes. The history of wolves in Montana has as much to do with the relationship between wolves and people as it does with the ecology of the species. The same will be true of the wolf's future. MFWP recognizes the importance, value, and need for a sustained educational public outreach program to parallel wolf management activities. The objective is to provide scientifically based, factual information. A collaborative approach will also be necessary, but MFWP will take the lead.

During the first five years after delisting, MFWP will document that the wolf population in Montana is secure. MFWP will informally consult with the USFWS and cooperating partners on a regular basis, including a periodic formal review by the USFWS. USFWS will point out any deficiencies or areas of concern and recommend

corrective actions to MFWP. We would take the necessary corrective measures to avoid a relisting of the gray wolf under ESA. MFWP will undertake its own thorough, formal review after the first five years. Cooperating state and federal agencies will also participate. Findings of the review will be incorporated. The wolf management program will be subsequently reviewed at least every five years. A more frequent review is provided for within the adaptive management model. By definition, the model incorporates monitoring and evaluation components as an ongoing effort within the management program. Management is thus refined and improved through time as information and experience accumulate.

Equally important components of any wolf management program are the social factors that shape public tolerance for wolves and their satisfaction with how conflicts are resolved. MFWP anticipates that the public will readily identify real or perceived problems or shortcomings of the program. The challenge for MFWP will be to discern between earnest differences of opinion in preferred management direction and substantive shortcomings. Wolf management in Montana will take place within a complex biological, social, economic, and political environment. Difficult decisions will have to be made and will sometimes be called into question by various interests. However, the ensuing public dialogue will also help evaluate the program and lead to revisions. The Wolf Management Advisory Council recommended that the State of Montana continue to engage a diverse advisory citizen's group to collaborate on the management of wolves.

We are committed to using MFWP funds and matching federal funds to conserve and manage this native species on equal standing with other carnivore species. We also acknowledge that existing financial resources are not adequate to fully implement all aspects of this plan. Some of the activities described in this plan fall within existing duties and responsibilities already carried out by MFWP or WS, but some activities clearly add to existing responsibilities and workloads. Additional funding will be required to implement wolf management (and related activities) and compensation. While the monies and administrative procedures to fulfill these parallel functions may or may not originate from the same source, adequate funds for each element are necessary. We will seek additional funding from a diversity of sources, including special state or federal appropriations, private foundations, or other private sources.

The personnel and financial resources necessary to fulfill the responsibilities of wildlife conservation and management, law enforcement, assurance of human safety, public outreach, resolution of wolf-livestock conflicts, compensation, and program administration is an estimated $765,296 annually. The budget truly reflects the comprehensive nature of designing and implementing a wolf program in the broadest sense of the word.

The Governors of Montana, Idaho, and Wyoming are pursuing a program called the Northern Rocky Mountain Grizzly Bear and Gray Wolf National Management Trust. The Trust identifies, supports, and funds initiatives which address grizzly and gray wolf management, monitoring, other conservation needs, habitat protection, scientific research, conflict resolution, compensation for damage, and education/public outreach activities. The Trust prospectus will be forwarded to the respective Congressional delegations. In light of local funding shortfalls, we hope that the tri-state Congressional delegation will recognize the need for secure, long term funding to address the unique challenges associated with the conservation and management of these species of significant national interest. Another potential source of long-term funding is the Conservation and Reinvestment Act (CARA). Title III would provide annual appropriations to the states specifically for fish and wildlife programs, outdoor recreation, and conservation education. These funds are intended to fulfill a need for funding of less traditional management programs for species that are typically not hunted or fished. MFWP could use these funds for most elements of the wolf program but not for compensation. Both potential funding mechanisms are stable, long-term sources of funding and engage the national interests that desire to see wild, free-roaming wolves in the northern Rockies. While MFWP also recognizes the value of having free-roaming wolves in the northern Rockies, we also seeking financial assistance to conserve and manage the species in a complex setting. Finding the balance without adequate funding will be challenging.

EXECUTIVE SUMMARY i

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INTRODUCTION

The State of Montana recognizes the gray wolf as a native species and we are committed to recovery of the species within our borders. We will ensure that wolf population is maintained at numbers sufficient to preclude reclassification as "threatened or endangered" under federal law in the three-state area of Montana, Idaho, and Wyoming. The state intends to implement positive management programs to make sure that recovery is complete and wolves are integrated as a valuable part of out wildlife heritage. Montana Fish, Wildlife & Parks is already engaged in activities which promote wolf recovery through its efforts on ungulate population monitoring, research, and management, through the acquisition and designation of Wildlife Management Areas, purchase of conservation easements, and other efforts to preserve and restore wildlife habitats.

Gray wolves (*Canis lupus*) are thriving and expanding in number and distribution in Montana. This is because of natural emigration from Canada and a successful federal effort that reintroduced wolves into Yellowstone National Park (YNP) and the wilderness areas of central Idaho. There are probably more wild wolves in Montana now than at any time in the last 70 years. Since 1973, the U.S. Fish and Wildlife Service (USFWS) has managed wolves as an endangered species in Montana, under the authority of the Endangered Species Act (ESA). Wolves are likely to be removed from the endangered species list within 3-5 years.

Upon delisting, management authority for wolves will return to the state governments where wolves reside. Montana Fish, Wildlife & Parks (MFWP) is the resource agency charged under state statute with the responsibility to manage resident wildlife, including wolves. Beyond the legal commitments, MFWP recognizes and accepts the challenges, responsibilities, and benefits of restoring wolves as an important part of Montana's wildlife heritage. Managing gray wolves will not be easy, but wolf restoration is fundamentally consistent with Montana's history of wildlife conservation. The State of Montana will make a long-term funding commitment to the conservation of wolves, commensurate with existing programs for other managed carnivores. MFWP will commit state wildlife funds, matching federal monies, and other agency resources, but existing financial resources will not be adequate. Supplemental funding will be sought from public/private foundations, other private sources, and special federal or state appropriations.

As a state, we are collectively walking down an untravelled and difficult path in resource management. This document is a critical step in the process of Montana regaining management responsibility for wolves after a 28-year period of federal management. This document must not only assure the long-term persistence of wolves, it must also address the challenges of having wolves in Montana after such a long absence. It is unlikely that the state could assume management authority if this wolf management plan falls short. Fortunately, Montanans have a long tradition of rising to challenges and expressing interest and support for wildlife in our state. In fact, much of this Plan is based on the comments and recommendations of a 12-member citizens group, the Montana Wolf Management Advisory Council. An Interagency Technical Committee assisted the Council during their deliberations.

We understand that the long-term persistence of wolves in Montana depends on carefully balancing the complex biological, social, economic, and political aspects of wolf management. No single interest can dominate management direction. As we have before, we will rely on the best available information, use good judgment, and listen closely to people who care about Montana's resources and our lifestyle, now and into the future. The long-term persistence of wolves will also depend on securing adequate funding from a diversity of sources to fully implement conservation and management strategies.

Purpose of This Document

Before the gray wolf can be removed from the endangered species list, the USFWS must evaluate all the potential threats to wolves when the protections of ESA are removed and management responsibility is returned to the states. Among the requirements for delisting, the USFWS determined that the states of Montana, Idaho, and Wyoming must have management plans and other adequate regulatory mechanisms in place to ensure that the recovered wolf population will remain secure.

State management plans are the primary mechanism by which the USFWS can assess future threats to wolves in the northern Rockies and determine whether a well-distributed, viable population will be sustained. The purpose of this

document is to describe the regulatory framework for wolf conservation and management in Montana, under the direction of MFWP. This plan also describes the programmatic direction and a spectrum of management activities that maintain viable wildlife populations, resolve wolf-human and wolf-livestock conflicts, and gain the support of people with diverse interests.

Goal of the Plan

MFWP recognizes the gray wolf as a native species and is committed to maintaining a tri-state wolf population at numbers sufficient to preclude reclassification as threatened or endangered under federal law. Montana will support a proportionate number of wolf packs towards the northern Rockies recovery goal identified by the USFWS. An equitable distribution of packs among the three states is consistent with the biological intent of the recovery plan, will ensure a well-distributed and viable wolf population in the region, and will foster greater public acceptance of wolves in Montana. MFWP intends to honor the diverse perspectives and interests of our citizens and the national public. The State will consider the wide spectrum of interests in designing and implementing a balanced, responsive program that recognizes the opportunities and addresses the challenges faced by people directly affected by wolves.

Plan Development

As the State of Montana prepares to assume authority for wolves, it was recognized that the people of Montana have a significant stake in wolf-related issues, and they should be provided an opportunity to deliberate how wolves are managed. To fulfill this public trust, former Governor Marc Racicot signed an Executive Order creating the Montana Wolf Management Advisory Council (Council) in April 2000. The Council was composed of 12 volunteers from around the state who represented a variety of interests including tribal, agriculture, hunting, and wildlife conservation. They served voluntarily, at the request of the Governor. The Council was asked to advise MFWP as it prepared to assume wolf management responsibilities and to consider input from Montana citizens and other interested parties. The Council adopted the following as its Mission Statement:

"To assist MFWP in developing an implementable plan that will maintain viable wolf populations and is socially acceptable, biologically possible, and economically feasible."

Using an "interest-based" process, the Council identified and deliberated issues related to: defense of life and human safety, livestock depredation, compensation for livestock losses, management of prey populations, and wolf conservation and management. An Interagency Technical Committee advised the Council, providing scientifically based information about biological, technical, legal, or financial aspects of wolf management. The Council relied on the Technical Committee as their primary source of factual information. The Technical Committee also helped the Council identify and assess challenges associated with implementing overall management strategies or specific management actions. It was comprised of wolf experts and resource managers from the National Park Service (NPS), USFWS, U.S. Forest Service (USFS), Wildlife Services (WS), and MFWP.

With assistance from MFWP, the Council prepared a report of its findings, which originated from their personal experiences, interests represented by members, input from the public, and information provided by the Interagency Technical Committee. The Council arrived at their findings and recommendations by consensus. The Council's Chairman and the MFWP Director presented the report to former-Governor Racicot just before he left office. Upon taking office, newly elected Governor Martz was briefed of the Council's work. She directed MFWP to complete a state wolf management plan, using the Council's deliberations and written report as the foundation. The report consists of a Preamble, a Mission Statement, Guiding Principles, program goals, and general objectives. The Council specifically deferred to the expertise and discretion of MFWP in some areas. The *Montana Wolf Management Advisory Council, Report to the Governor* is included in this plan as Appendix 1.

HISTORY AND LEGAL STATUS OF WOLVES IN MONTANA

History

The gray wolf occupied most of the North American continent at the time of European settlement. Its range was reduced dramatically and wolves were extirpated from the east coast to the Ohio Valley by the 1880s. Gray wolves

were still fairly common throughout most of the northwestern United States until the early 1900s (Young and Goldman 1944).

In Montana, wolves were widespread throughout the state at the time of European settlement. Early trappers and explorers, including Lewis and Clark, recorded wolf sightings and encounters in their diaries. The first statewide bounty law passed in 1884 and wolf eradication in Montana began. In that first year, 5,450 wolf hides were presented for payment. Only 3 Montana counties (as they existed in 1900) failed to report a bounty payment for wolves from 1900-1931 (Riley 1998). By 1936, wolves were probably extinct in Montana, although they were occasionally observed and killed in the 1950s and 1960s (Curnow 1969, Singer 1979, Day 1981, Ream and Mattson 1982). No breeding pairs were known in Montana in the 1970s, and the occasional wolves taken were probably dispersers from Canada. In the 1960s, the Canadian Province of Alberta reduced its widespread predator control efforts (Ream and Mattson 1982). This probably resulted in higher survivorship and dispersal of wolves from Canada to Montana. Wolves were not legally protected in the U.S. until 1973, with the passage of ESA.

Pursuant to ESA, the Northern Rocky Mountain Wolf Recovery Team completed a recovery plan in 1980, with amendments added in 1987. The Plan designated three recovery areas (Northwest Montana, Central Idaho, and the Greater Yellowstone Area), each of which include some portion of Montana (Fig. 1). The USFWS determined that a total of 30 breeding pairs, with an equitable distribution throughout the states of Idaho, Montana, and Wyoming would constitute a viable, recovered population in the northern Rockies (USFWS et al. 2001). The number of breeding pairs is the measure by which the USFWS evaluates progress towards recovery. A breeding pair is defined as at least two adult wolves with at least two pups that survive to December 31. When a total of 30 breeding pairs is documented for 3 successive years, the USFWS will initiate the delisting process, which removes the federal protections conferred by ESA.

Wolves started naturally recolonizing the Glacier National Park (GNP) area of northwestern Montana in 1979. Reproduction was documented just north of GNP in 1982 (Ream and Mattson 1982). In 1986, the first wolf den in the western United States in over 50 years was documented within GNP (Ream et al. 1989). The newly colonizing wolf population in the GNP area fell within the Northwest Montana Recovery Area. Since then, new packs have established throughout western Montana. They were started by founders from Canada, the GNP area, and their descendants. Northwest Montana has supported a minimum of 5-7 breeding pairs since 1995 (USFWS et al. 2001).

As wolves recolonized northwest Montana, the other two recovery areas, Central Idaho and the Greater Yellowstone Area (GYA) remained devoid of wolves except for occasional reports of single or lone wolves. No reproduction had been documented in either area since the 1930s. In 1995 and 1996, the USFWS reintroduced a total of 66 wolves from Alberta and British Columbia into the wilderness areas of central Idaho and Yellowstone National Park (YNP), Wyoming. These reintroductions were undertaken on an experimental basis and the populations were considered non-essential to the survival of the species. The "experimental, non-essential" status of these wolves granted additional management flexibility. In 2000, the USFWS et al. (2001) documented 13 breeding pairs in the Greater Yellowstone Recovery Area and 9 pairs in the Central Idaho Recovery Area.

While the USFWS presently tabulates the number of breeding pairs by recovery area as a subtotal of the 30 total pairs required, the recovery area boundaries dissolve into the individual state boundaries upon delisting. Using the same definition of breeding pair, Montana had eight breeding pairs whose territories lie entirely within its borders in 2000 (USFWS et al. 2001). Three additional breeding pairs had territories that straddle the Montana-Idaho or Montana-Wyoming borders in 2000. There are other wolf pairs or small packs within Montana for which reproduction was not confirmed in 2000, but appear to have established a stable territory entirely within Montana. Several new packs appeared to form in 2001, but a final count of packs within

Montana's borders will not be available from USFWS until early in 2002. In the interim, the USFWS updated its most recent annual report with unpublished data on wolf packs in Montana, as it was known in September 2001 (Fig. 2).

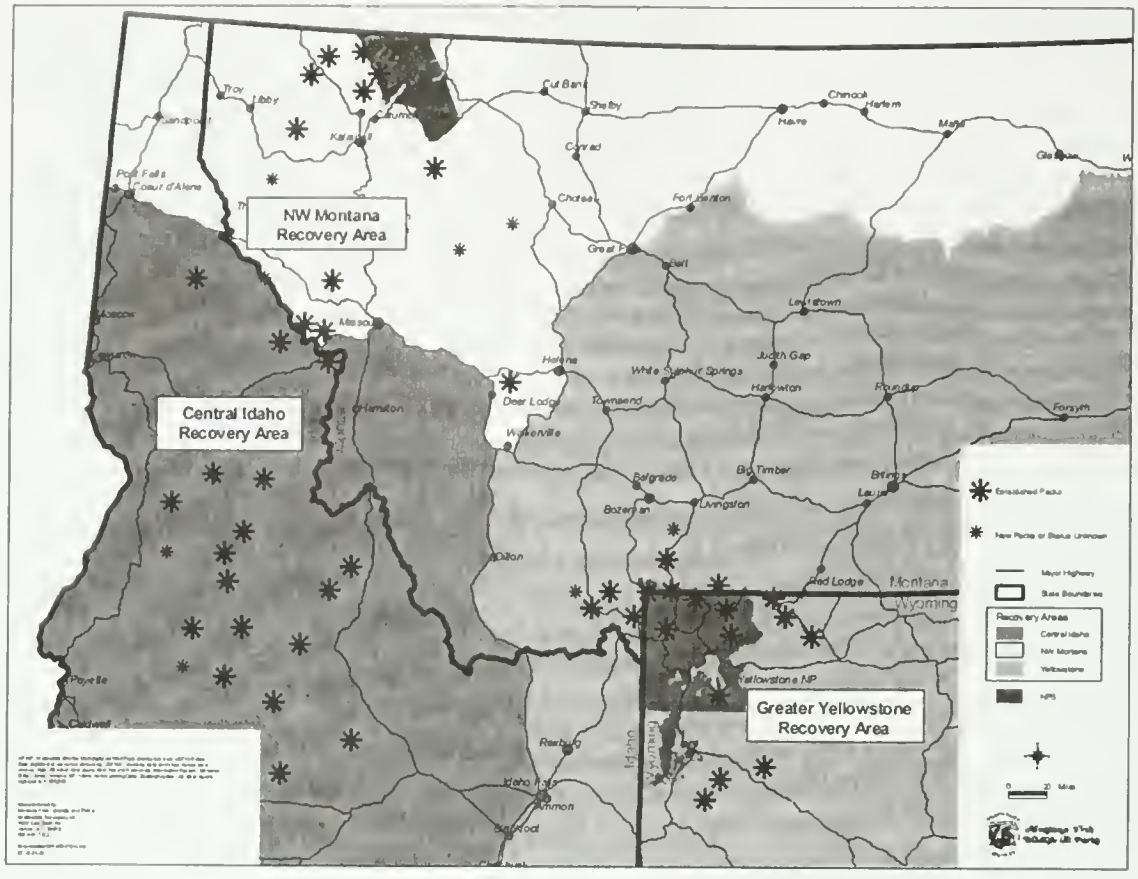

Figure 1. Wolf pack distribution in Montana, Idaho, and Wyoming and the recovery area boundaries. Large symbols represent established packs. Small symbols indicate newly-formed packs or packs whose status is unknown at the present time. (Source: USFWS et al. 2001 and USFWS unpubl. data as of September 2001).

Ongoing efforts by the USFWS and its cooperating partners to monitor wolves in the tri-state area have led to the discovery of new wolf packs successfully raising at least two pups in 2000. Because yearling wolves were captured in 2001, the pack must have successfully reared pups to December 31 in the year 2000. Therefore, the calendar year 2000 is the first year of the three-year count down in which a total of 30 breeding pair were tabulated towards the recovery goal. It appears that 2001 will be the second year since there are about 45 breeding pair that could potentially raise pups to December 31, 2001. If 30 breeding pair are again documented in December 2002, the USFWS could propose to delist wolves from ESA. The USFWS cannot delist wolves without the respective states first adopting conservation and management plans.

While the history of the gray wolf in Montana and its eventual return is a story in and of itself, the story is not complete without also acknowledging the history of prey populations over a similar time span and the role of Montana sportsmen and women.

No one really knows how many deer and elk were present at the time of the Lewis and Clark Expedition or even for decades thereafter. But before the 19th century was over, big game populations were depleted over most of the landscape because of excessive commercial and subsistence hunting. In 1867, Granville Stuart, an early conservationist and territorial legislator in Montana, acknowledged that the territorial legislature "needed to enact some laws or there will not be, in a few years, so much as a minnow or deer left alive in all the territory" (Brownell

1987). Enforceable wildlife conservation would finally begin with the political and financial support of Montana hunters and anglers early in the 20th century. Early programs emphasized restoring game animals and aggressive predator control. Even still, the Montana Legislature classified the grizzly bear as a game animal in 1923 so it could be protected from predator control programs – 50 years before there was an Endangered Species Act. The mountain lion was classified as a game animal in 1971 -- 2 years before ESA. Lion restoration was assured, not by the legal protections of ESA, but by the regulation of human-caused mortality and the restoration of prey populations. These successful programs were then, and, are now sustained by a philosophy of public hunting and a funding base from participants. These were imbedded in Montana culture starting with the earliest territorial residents.

Present day populations of white-tailed deer and elk are at their highest levels recorded in recent history. Mule deer numbers fluctuated over the last 20 years, but the statewide population is still robust. The sportsmen and women of Montana shepherded the restoration of those populations from all time lows. Because of their long-term financial investments and willingness to restrict themselves when necessary, Montanans now enjoy relatively liberal hunting seasons for more ungulate species than other western states. The restoration of native ungulate populations to former (and new) habitats and in large numbers facilitated wolf restoration. It is a rich heritage of which Montanans can be proud.

Legal Status and Classification under Montana Statutes

At present, USFWS and WS are responsible for wolf restoration and management activities. Federal laws provide guidance. When wolves are delisted and management authority is transferred to the State of Montana, state laws become the primary regulatory and legal mechanisms guiding management. Two Titles within Montana statutes describe the legal status and management framework for wolves. Title 87 pertains to fish and wildlife species and oversight by MFWP. Title 81 pertains to the Montana Department of Livestock (MDOL) and their responsibilities related to predator control. Most recently, the 2001 Montana Legislature passed Senate Bill 163 (SB163), which amended several statutes in both Titles. Governor Martz signed SB163 on April 21, 2001. The text of SB163 is presented in Appendix 2.

For now, the gray wolf remains listed as an endangered species under the Montana Nongame and Endangered Species Conservation Act of 1973 (87-5-101 MCA). The USFWS anticipates that wolf populations in the northern Rocky Mountains will meet the recovery goals in the near future. At that time, the USFWS will initiate the federal delisting process. Provisions in SB163 automatically remove the gray wolf from the state endangered species list, concurrent with federal action concluding that wolves are no longer endangered. Separate action by the Montana Legislature is not required, but MFWP would still need to update its Administrative Rule 12.5.201, which lists state threatened and endangered species.

Once removed from the state endangered species list, the gray wolf will automatically be classified as a species "in need of management." MFWP and the MFWP Commission will then establish the regulatory framework to manage the species (MCA 87-5-101 to 87-5-123). "Management" is defined in MCA 87-5-102 as:

> "the collection and application of biological information for the purposes of increasing the number of individuals within species and populations of wildlife, up to the optimum carrying capacity of their habitat, and maintaining such levels. The term includes the entire range of activities that constitute a modern scientific resource program including but not limited to research, census, law enforcement, habitat improvement, and education. Also included within the term, when and where appropriate, is the periodic or total protection of species or populations as well as regulated taking."

In Montana statute, "take" means to "harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife." Thus, MFWP and the MFWP Commission will establish the management parameters and regulations that limit taking, possession, transportation, exportation, processing, sale, offer for sale, or shipment of wolves. In addition, MFWP and the MFWP Commission will initiate the law enforcement, population monitoring, educational components, and other elements of a wolf program.

When MFWP and the MFWP Commission determine that the wolf population no longer fits the definition of a species "in need of management," the MFWP Commission may reclassify the wolf as a big game animal or a furbearer when wolf numbers have increased to the point where population regulation is needed. Regulated public

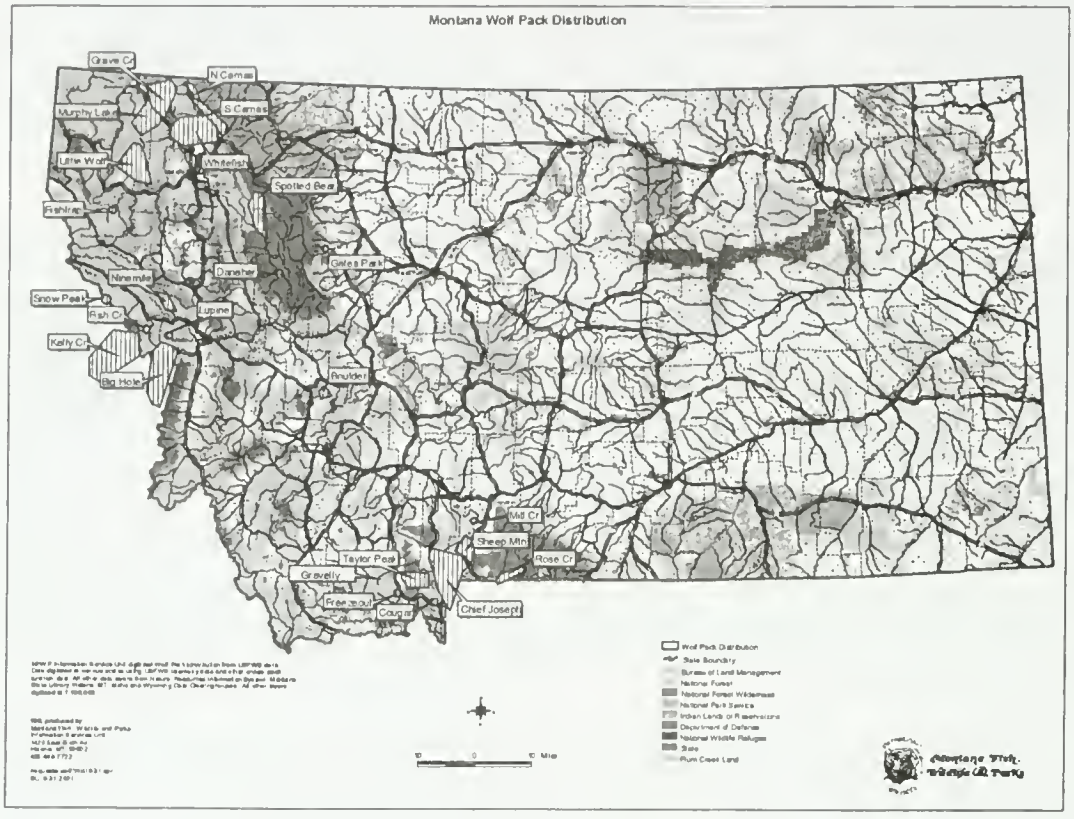

Figure 2. Wolf pack distribution by name and land ownership pattern in Montana. Approximate wolf pack territories are designated with horizontal lines. Gray tones represent public lands and white indicates private lands. (Source: USFWS et al. 2001 and USFWS unpubl. data as of September 2001).

harvest of wolves by hunting and trapping is one tool that may help MFWP manage wolf numbers. MFWP recommendations, public input, and MFWP Commission actions will establish the conditions and regulatory framework for the legal hunting and trapping of wolves in Montana. The Montana Legislature would establish the license fees and penalties for violations of Montana laws or MFWP Commission rules about the possession or harvest of wolves.

SB163 also amended Montana Statute 87-3-130, which is titled "Taking of Wildlife to Protect Persons or Livestock." This amendment becomes effective only when federal protections are removed. As amended, this Statute relieves a person from criminal liability for the taking of a wolf if the wolf is "attacking, killing, or threatening to kill a person or livestock." In addition, "a person may kill or attempt to kill a wolf or mountain lion that is in the act of attacking or killing a domestic dog." The definition of livestock includes ostriches, rheas, and emus. These changes are consistent with the concepts of protecting human life and private property (livestock and pets) when it is in imminent danger. Citizens must report any solves killed or injured in defense of life/property to MFWP within 72 hours.

Most importantly, SB163 resolved an element in Montana statute that was a major impediment to establishing the adequate regulatory mechanisms to guarantee the security and perpetuation of a recovered wolf population. SB163 deleted the gray wolf from the list of species designated as "predatory in nature" which are to be systematically controlled by MDOL (MCA 81-7-101 to 81-7-104). In other words, MDOL will not be required to exterminate wolves upon delisting. Instead, MDOL will control wolves for the protection and safeguarding of livestock, as long as the control action is consistent with a wolf management plan approved by both MFWP and MDOL. MDOL and MFWP will cooperatively address and resolve wolf-livestock conflicts using the management strategies described in this plan.

WOLF ECOLOGY IN THE NORTHERN ROCKIES

Physical Characteristics

Male gray wolves in Montana weigh 90-110 pounds, and females weigh 80-90 pounds. Wolves in the GYA are slightly heavier. Smith et al. (2000) reported that in 1999, winter-captured adult females averaged 108 pounds, while female pups averaged 96 pounds. Male pups averaged 107 pounds. About half of the wolves in Montana are black and the remainder gray. Both color phases may be found in a pack or in one litter of pups. White wolves, usually old animals, are occasionally seen. Tracks are normally 4.5 to 5.5 inches long (Harris and Ream 1983).

Wolves may resemble coyotes, particularly when wolves are young. Wolves may also be confused with some large domestic dog breeds. Wolves are distinguished from dogs by their longer legs, larger feet, wider head and snout, narrow body, and straight tail. Other distinguishing characteristics require closer examination than is possible in field settings with live animals. In many instances, behavior distinguishes between wild wolves, wolf-dog hybrids, and domestic dogs (Boyd et al. 2001, Duman 2001).

Pack Size

The gray wolf is a highly social species that lives in packs. Packs are formed when male and female wolves develop a pair bond, breed and produce pups. The pack typically consists of a socially dominant breeding pair (alphas), their offspring from the previous year, and new pups. Other breeding-aged adults may be present, but they may or may not be related to the others. Cooperatively, the pack hunts, feeds, travels, and rests together. The pack also shares pup-rearing responsibilities, including hunting and tending pups at the den or at a series of rendezvous sites. Pack size is highly variable (USFWS et al. 2001). In northwest Montana, it ranges from 2 to 11, and averages 5-7. In the GYA, pack size ranges from 5 to 27 and averages 9.3. Average pack size is larger inside YNP (14.6 individuals) than outside (5.8 individuals) (Smith et al. 2000).

Reproduction

Wolves normally do not breed until at least 22 months of age (Mech 1970). Breeding usually occurs only between the dominant male and female in a pack. In the northern Rockies, the breeding season peaks in mid- to late February

(Boyd et al. 1993). Wolves localize their movements around a den site and whelp in late April, following a 63-day gestation period. Wolves may be sensitive to human disturbance during the denning season. After the pups are about eight weeks old, they are moved to a series of rendezvous sites. In northwest Montana, maximum litter size averaged 5.3 (range 1-9) from 1982 to the mid 1990s. By December, average litter size declined to 4.5 (Pletscher et al.1997). In central Idaho, average litter size was 5.1 from 1996-1998 (Mack and Laudon 1998).

Pup survival is highly variable and influenced by several factors, including disease, predation, and nutrition (Mech and Goyal 1993, Johnson et al. 1994). In northwestern Montana from 1982-1995, 85% of pups survived until December, though survival varied year to year (Pletscher et al. 1997). Pup mortality in the first eight months of life was attributed to human causes (8 of 20 mortalities, 40%), unknown causes (2 of 20, 15%), and disappearance (9 of 20, 45%). In YNP, during the first four years, 133 pups were born in 29 litters and 71% were believed to still be alive in 1998 (Bangs et al. 1998). Pup survival varied between 73 and 81% from 1996-1998. However, canine parvovirus was strongly suspected as a contributing factor in the low pup survival (45%) in 1999. In 2000, pup survival rebounded to 77% (Smith et al. 2000). In central Idaho, 92-99 pups were produced between 1995 and 1998 (Mack and Laudon 1998).

Occasionally, more than one female in a pack may breed, resulting in more than one litter per pack (Ballard et al. 1987). This phenomenon has been documented in YNP (Smith et al. 2000, USFWS et al. 2000, USFWS et al. 2001). In 1999, one pack had two litters. In 2000, 13 wolf packs produced 16 litters. Occasionally this phenomenon leads to the formation of a new pack (Boyd et al. 1995).

Food Habits

The gray wolf is an opportunistic carnivore and is keenly adapted to hunt large prey species such as deer, elk, and moose. Wolves may scavenge carrion or even eat vegetation. In Montana, white-tailed deer, mule deer, elk and moose make up the majority of wolf diets. In northwestern Montana, white-tailed deer comprised 83% of wolf kills, whereas elk and moose comprised 14% and 3%, respectively (Kunkel et al. 1999). However, 87% of wolf kills in YNP during 1999 were elk (Smith et al. 2000). In central Idaho, elk (53%) and deer (42%) were the most frequently detected species in scat samples collected in summer 1997 (Mack and Laudon 1998). Ungulate species compose different proportions of wolf diets, depending on the relative abundance and distribution of available prey within the territory.

Wolves also prey on smaller species such as rabbits or beaver. Wolf scat collected in YNP in 1998 contained voles, ground squirrels, snowshoe hare, coyote, bear, insects, and vegetation (Smith 1998). Earlier work in northwestern Montana also documented non-ungulate prey species, such as: ruffed grouse, raven, striped skunk, beaver, coyote, porcupine, and golden eagle (Boyd et al. 1994).

Wolves also scavenge opportunistically on vehicle- or train-killed ungulates, winterkill, and on kills made by other carnivores, particularly mountain lions. Wolves in northwestern Montana scavenge the butchered remains of domestic livestock or big game animals at rural bone yards or carcass disposal sites. In most instances, private individuals discard these remains on nearby public land. Some northwestern Montana packs also scavenge ungulate carcasses cleared from local highways and left in a gravel pit by the Montana Department of Transportation. Wolves may also kill and feed upon domestic livestock such as cattle, sheep, llamas, horses, or goats. They may also kill domestic dogs but usually do not feed on the carcass.

Movements and Territories

A pack establishes an annual home range or territory and defends it from trespassing wolves. From late April until September, pack activity is centered at or near the den or rendezvous sites, as adults hunt and bring food back to the pups. One or more rendezvous sites are used after pups emerge from the den. These sites are in meadows or forest openings near the den, but sometimes are several miles away. Adults will carry small pups to a rendezvous site. Pups travel and hunt with the pack by September. The pack hunts throughout its territory until the following spring.

Pack boundaries and territory sizes may vary from year to year. Similarly, a wolf pack may travel in its territory differently from one year to the next because of changes in prey availability or distribution, intraspecific conflict with nearest neighbors, or the establishment of a new neighboring pack. Because the attributes of each pack's

territory are so unique (elevations, land use, land ownership patterns, prey species present and relative abundance, etc.), it is difficult to generalize about wolf territories and movements.

After recolonizing the GNP area in the 1980s, individual wolves dispersed and established new packs and territories elsewhere in western Montana. Wolves demonstrated a greater tolerance of human presence and disturbance than previously thought characteristic of the species. It was previously believed that higher elevation public lands would comprise the primary occupied habitats (Fritts et al.1994). While some packs have established territories in backcountry areas, most preferred lower elevations and gentle terrain where prey is more abundant, particularly in winter (Boyd-Heger 1997). In some settings, geography dictates that wolf packs use or travel through private lands and co-exist in close proximity with people and livestock. Since the first pack established a territory outside the GNP area in the early 1990s, packs in northwestern Montana negotiated a wide spectrum of property owners and land uses. These colonizers also settled across an array of rural development.

With the exception of GNP packs, wolves in northwest Montana move through a complex matrix of public, private, and corporate-owned lands. Landowner acceptance of wolf presence and the use of private lands is highly variable in space and time. Given the mobility of the species and the extent to which these lands are intermingled, it would not be unusual for a wolf to traverse each of these ownerships in a single day. Land uses range from dispersed outdoor recreation, timber production, or livestock grazing to home sites within the rural-wildland interface, hobby farming/livestock, or full-scale resort developments with golf courses. For example, private lands make up 55% of the Little Wolf pack's territory west of Kalispell (USFWS unpubl. data). The majority is owned by Plum Creek Timber Company and managed for commercial timber production. While technically private property, Plum Creek lands are generally open to public recreation. Livestock are present under a grazing lease between the company and a local grazing cooperative. The remaining 45% of the pack's territory is public land and managed for multiple uses. In contrast, individual citizens manage 53% of the private land in the Boulder pack's territory west of Helena for livestock production.

Private land may offer habitat features that are especially attractive to wolves so the pack may utilize those lands disproportionately more often than other parts of their territory. Land uses may predispose a pack to conflict with people or livestock, although the presence of livestock does not make it a forgone conclusion that a pack will routinely depredate. Domestic livestock are present year round within the territories of many Montana packs. For example, since the late 1980s, the Ninemile and Murphy Lake packs encountered livestock regularly, but caused conflict only sporadically.

The earliest colonizing wolves had large territories. Ream et al. (1991) reported an average of 460 square miles (mi^2). In recent years, average territory size decreased, probably as new territories filled in suitable, unoccupied habitat. In the Northwest Montana Recovery Area during 1999, the average territory size was 185 mi^2 (8 packs). Individual territories were highly variable in size, with a range of 24-614 mi^2 (USFWS et al. 2000).

Territories in the GYA were larger, averaging 344 mi^2 (11 packs). Individual pack territories ranged from 33 to 934 mi^2. Central Idaho wolf packs had the largest average territory size of 360 mi^2 (13 packs), with individual pack territories ranging from 141 – 703 mi^2 (USFWS et al. 2000).

Dispersal

When wolves reach sexual maturity, some remain with their natal pack while others leave, looking for a mate to start a new pack of their own. These individual wolves are called dispersers. Dispersal may be to nearby unoccupied habitat near their natal pack's territory or it may entail traveling several hundred miles before locating vacant habitat, a mate, or joining another pack. Animals may disperse preferentially to areas occupied by conspecifics (Ray et al. 1991). This appears true for the gray wolf, a species that utilizes scent marking and howling to locate other wolves (Ray et al. 1991). Boyd and Pletscher (1999) indicated that the dispersers in their study moved towards areas with higher wolf densities than found in their natal areas – in this case northward towards Canada. This has important implications for wolves in Montana, which now have conspecifics to the south and west in central Idaho and YNP. Dispersal has already resulted in the formation of several new packs in Montana (Fig. 2) (Boyd et al. 1995, USFWS et al. 2001). Wolves will probably continue dispersing from the core areas and slowly occupy landscapes between the Canadian border, central Idaho and northwestern Wyoming (USFWS et al. 2000).

Ultimately, this will yield a meta-population, capable of genetic exchange across the northern Rocky Mountains (Forbes and Boyd 1996, 1997).

Boyd and Pletscher (1999) studied wolf recovery in northwestern Montana from 1979 to 1997. Male wolves dispersed at an average age of 28.7 months and traveled an average of 70 mi from their natal territory before establishing a new territory or joining an existing pack. Females averaged 38.4 months old at dispersal and traveled an average of 48 mi. Males and females, combined, traveled an average of 60 mi (range 10 – 158 mi). A captured sample of males and females dispersed at rates proportional to their occurrence. There were two peaks of dispersal: January-February (courtship and breeding season) and May-June.

The Yellowstone Wolf Project documented 36 dispersal events (18 females and 18 males) from 1995-1999 (Smith et al. 2000). Males dispersed an average of 54 mi and females dispersed an average of 40 mi. The longest recorded dispersal of a Yellowstone wolf to date was 221 mi. This Yellowstone-born male ultimately settled in central Idaho.

Increasingly, dispersal is being documented among and between all three recovery areas in the northern Rockies (Bangs et al. 1998, Mack and Laudon 1998, Smith et al. 2000). Combined, there were 21 known dispersal events in 2000 and 19 in 1999 (USFWS et al. 2000). Dispersal paths crossed international boundaries, state boundaries, public and private land boundaries, different land uses, and agency jurisdictions.

Mortality

Wolves die from a variety of causes, usually classified as either natural or human-caused. Naturally caused mortalities result from territorial conflicts between packs, injuries while hunting prey, old age, disease, starvation, or accidents. In an established Alaskan wolf population largely protected from human-caused mortality, most wolves were killed by other wolves – usually from neighboring packs (Mech et al. 1998). However, in the northern Rockies, natural mortality probably does not regulate populations (USFWS 2000). Humans are the largest cause of wolf mortality and the only cause that can significantly affect populations at recovery levels (USFWS 2000). Human caused mortality includes control actions to resolve conflicts, legal and illegal killings, as well as car/train collisions.

Pletscher et al. (1997) studied survival and mortality patterns of wolves in the GNP area. Total annual survival for this semi-protected population was a relatively high 80%. The survival rate for resident wolves was even higher (84%), but dispersers had a 64% chance for survival. Despite the high survival rates, humans accounted for the vast majority of wolf deaths. Of the 43 deaths investigated from 1982-1995, 88% were human-caused (56% legal, 32% illegal). Three wolves died of natural causes and two died of unknown causes.

More recent mortality data are available from the USFWS et al. (2001). In the Northwest Montana Recovery Area, there were at least 18 mortalities in 2000. Cause of death was known for 15. At least seven wolves were illegally killed, four died in agency control actions, and four wolves died from vehicle /train collisions. In the GYA, at least 20 wolves died in 2000, and the cause of death is known for 15. Nine wolves died due to human causes (six control actions, two vehicle collisions, one illegal) and six died from natural causes. Five additional mortalities were documented, but the causes were not readily apparent. These were either classified as unknown or unresolved pending further investigation. In the Central Idaho Recovery Area, 17 human-caused mortalities were documented in 2000. Control actions removed ten. One wolf died of natural causes and five more died from unknown causes.

Genetics

In recent years, the application of genetic techniques to the study of wildlife populations has permitted managers to address issues of genetic diversity and population viability with increased confidence. These techniques have yielded information relevant to wolf conservation and management in the northern Rockies. Wolf recovery in the northern Rockies advanced from the combination of recolonization of northwestern Montana by relatively few wolves from Canada and the reintroduction of wolves into YNP and central Idaho. In northwestern Montana, the founding population was small enough that inbreeding among closely related individuals was possible. Fortunately, the genetic variation among the first colonizers was high (Forbes and Boyd 1996). The combination of high genetic variation among colonizers and ongoing natural dispersal to and from Canadian populations was adequate to assure long-term population viability, provided that genetic exchange continued.

Similar concerns existed for the relatively small founding population reintroduced to YNP and central Idaho. But wolves were trapped from two distinct source populations in Canada. The genetic variation among reintroduced wolves (and the source populations from which they came) was also high (Forbes and Boyd 1997). Overall, heterozygosity was similar among samples of natural recolonizers, reintroduced individuals, and the Canadian source populations. Field studies of wolf dispersal and migration distances supported the genetic results (Ream et al. 1991, Boyd et al. 1995, Boyd and Pletscher 1999). Wolf populations in the northern Rockies should not suffer from inbreeding depression.

An underlying tenant of the wolf recovery and restoration program is that each state's wolf population is functionally connected so that genetic material can be exchanged among all three. In isolation, none of the three populations could maintain its genetic viability (USFWS 1994a, Fritts and Carbyn 1995).

Population Growth

Wolf populations increase or decrease through the combination and interaction of wolf densities and prey densities (Keith 1983, Fuller 1989). Actual rates of change depend on whether the wolf population is pioneering vacant habitat (as in YNP and central Idaho) or whether the population is well established (as in northwestern Montana). The degree and type of legal protection, agency control actions, and regulated harvest also influence population trends. Once established, wolf populations apparently can withstand human-caused mortality rates of up to 28-35% without declining (Keith 1983, Fuller 1989).

If protected, low density wolf populations can increase rapidly if prey is abundant. Keith (1983) speculated that a 30% annual increase could be the maximum rate of increase for any wild wolf population. Once densities were high enough, social interactions probably intensify. Intraspecific conflict and increased competition for food eventually cause the population to level off or decline (Keith 1983, Fuller 1989).

Wolf populations in the GNP area (northwestern Montana and southeastern Alberta) increased an average of 23% annually from 1986-1993 (Fritts et al. 1995). After 1993, the population leveled off (Pletscher et al.1997). Those packs produced dispersers that eventually colonized vacant habitats in western Montana (USFWS unpubl. data). Some packs which formed in the Northwestern Montana Recovery Area since the early 1990s persisted, but others did not. Packs have been lost due to illegal mortality, control actions where livestock depredation was chronic, and for other unknown reasons.

The average annual rate of increase from 1992 to 2000 in northwestern Montana was 4.7% (USFWS et al. 2001). In 1992, the minimum mid-winter count (including pups) was 41 wolves. Sixty-two wolves were counted in 2000. The highest count was 70 wolves, at the end of 1996. The population grew in some years, but declined in others. Some of the variation probably reflects true changes wolf numbers, but some variation may be due to monitoring inaccuracy or decreased monitoring effort.

Prey populations influenced recent wolf population dynamics in northwestern Montana. White-tailed deer populations expanded from the late 1970s through the mid 1990s, in part precipitating and sustaining increases in wolf numbers and distribution. However, the winter of 1996/97 was exceptionally severe, and white-tailed deer populations declined significantly (Sime, unpubl. data). Other prey populations also declined and poor recruitment was attributed to winterkill. The USFWS believes that the significant decline in natural prey availability led to the record high number of livestock depredations and subsequent lethal control. Wolf depredations on livestock in 1997 alone accounted for 50% of all depredations in northwestern Montana between 1987 and 1999. Smaller prey populations likely translated to decreased wolf pup survival in 1997 and 1998, compared to 1996. Ungulate populations rebounded in recent years and the wolf population is also nearing its 1996 level.

Wolf populations in the GYA and central Idaho areas exceeded all expectations for reproduction and survival (Bangs et al. 1998). Populations became established in both areas within 2 years, rather than the predicted three to five years. Pup production and survival in the GYA has been high. The average annual growth rate for the GYA from 1996-2000 is 35%, based on the minimum count as of December 31 and including pups (USFWS et al. 2001). However, population growth in the GYA slowed in 1999 after the rapid increase in the first three years post-

reintroduction (Smith et al. 2000). The average annual growth rate for this population is 36%, based on minimum counts on December 31 and including pups (USFWS et al. 2001).

It is likely that population growth rates will slow for both the core Yellowstone and central Idaho populations because of declining availability of suitable, vacant habitat. However, these populations will be a source of founders for new packs outside YNP, central Idaho, Wyoming, and Montana. While population growth slows or levels off in core areas, wolf numbers and distribution outside core areas are expected to increase rapidly in the next few years as wolves born in the initial pulse sexually mature and disperse to colonize vacant habitats elsewhere.

Pack membership typifies the predominant manner in which a wolf exists in the wild. The pack is the mechanism by which wolves reproduce and populations grow. However, in most wolf populations, some lone, nomadic individuals exist as dispersers -- looking for vacant habitat, waiting to be found by a member of the opposite sex within a new home range, or searching for an existing pack to join. Up to 10-15% of a wolf population may be comprised of lone animals.

This is a temporary transition. Wolves in northwestern Montana usually found other wolves in an average of 66 days (range 2-202 days) (Boyd and Pletscher 1999). Occasionally, lone wolves get into conflict with people and/or livestock, ultimately being lost to the population through legal or illegal means. For a wolf to make a contribution to the population, it must affiliate with other wolves. Until they affiliate with a pack, lone wolves are generally counted separately or omitted from population counts altogether because they do not contribute to population growth.

Interactions with Other Species

The relationships between carnivores and other species, and the ecosystems in which they live, could be the most poorly understood and controversial dimension of carnivore ecology (Estes 1996). The real question is not whether carnivores play important, unique roles in the natural functioning of ecosystems, but rather how they go about it, to what degree, and at what scale (Mech 1996).

Wolves could function as a "keystone species," which exists at relatively low abundance, whose effect on its community or ecosystem is relatively large and involves multiple trophic levels (Power et al. 1996, Estes 1996). Despite the volumes of published literature on gray wolves, there is remarkably limited evidence of the precise nature, degree, and mechanisms by which the species demonstrates ecosystem-level effects.

Wolves kill ungulates, but the effects on ungulate populations are varied. Scavenging species, such as coyotes, common ravens, and wolverines feed on wolf kills. A wide variety of scavengers and other carnivores benefit from carrion being readily available year round, rather than just a pulse in the early spring because of winterkill (Stahler et al. 2001). Wolves may directly or indirectly compete for food with other carnivores (e.g. mountain lion) by selecting similar prey, or by usurping kills (Kunkel et al. 1999). Wolves have even been observed harassing grizzly bears in an attempt to take over ungulate carcasses (D. Boyd pers. comm.). Wolves sometimes kill other carnivores, such as mountain lions, coyotes, or grizzly bear cubs (White and Boyd 1989, Boyd and Neale 1992, Arjo 1998, Crabtree and Sheldon 1999).

VALUES OF WOLVES IN MONTANA

Biological

Predatory mammals such as the gray wolf are probably vital to the integrity of many ecosystems (Estes 1996). Interactions between top-level carnivores and prey species through evolutionary time has shaped and fine-tuned each one morphologically and behaviorally into what they are today. In the absence of those functional relationships, ecological systems may not be balanced.

Top-level carnivores may speed up nutrient cycling, provide carrion for other species, cull sick or weak animals, and contribute to biological diversity. Broader habitat management and conservation purposes are also served by the presence of large carnivores such as the gray wolf (Fritts et al. 1994). Providing and sustaining an adequate prey

base for wolves and other carnivores, requires that ungulates be carefully managed and their habitats protected, which ultimately benefits entire plant and animal communities.

Because wolves and other large carnivores have large home ranges, attention should be focused on the habitat values of both public and private lands. Private lands, in particular have substantial value to wildlife because they frequently occur at low elevations which moderate extreme weather conditions such as deep snow. Voluntary habitat conservation efforts, such as land or vegetation management plans and conservation easements will ultimately benefit many wildlife species.

Social, Cultural, Aesthetic

The social, cultural, and aesthetic values of wolves today grow out of a long and colorful history of interactions between wolves and humans. Early Native American Indians shared the landscape with the gray wolf. The wolf ultimately attained a cultural significance to many Native American tribes in Montana. For the Blackfeet, the wolf is a powerful religious symbol and is known as a "medicine animal" (Vest 1988).

In the days of European settlement and for decades thereafter, wolves were viewed unfavorably because they killed livestock during a period of dramatic declines in native prey populations. Wolves were also perceived as a negative, controlling influence on prey populations. However, public opinion about predators and wolves, in particular, evolved through the 1960s and 1970s. The gray wolf came to symbolize changing attitudes about wildlife, the environment, and public lands. Finally with the passage of the ESA and similar laws in the states, changing attitudes were institutionalized. Increasingly, the national public embraced the wolf as a symbol of wilderness and the call to save imperiled species. The calls were simultaneously reinforced by the media, which promoted broad public interest in wolves and their ultimate restoration into former habitats in the northern Rockies. Today, 62% of respondents in a national survey indicated that they were satisfied just knowing that wolves would be present in YNP (Duffield et al. 1993).

For some, the gray wolf symbolizes the diversity of American thought, values, and opinions. From persecuted beast, to dogged survivor, to the top of the food chain in America's first national park, the gray wolf's lot and human attitudes have gone full circle. Yet, there remains a great diversity in the social, cultural, and aesthetic values that Montanans assign to gray wolves.

Economic

Montana is well known for its national parks, wilderness areas, vast expanses of public lands, and a high quality environment that sustains healthy populations of native fish and wildlife. Visitors and residents alike enjoy hunting, fishing, wildlife viewing, and other forms of outdoor recreation. In 1992, YNP area residents reported a 90% rate of participation in wildlife viewing activities. Similarly, 94% of visitors who spent more than one day in YNP reported that their activities included viewing wildlife (USFWS 1994a).

The presence of wolves in Montana has contributed to the interest and visitation to national parks, as well as to the perceptions of Montana having diverse and abundant natural resources. It is estimated that more than 30,000 visitors to YNP from 1995-1998 saw wolves (Bangs et al. 1998). As of August 2001, 85,000 people have seen wolves in YNP (D. Smith pers comm.). The majority of nonresident visitors to Montana surveyed in 1999 ranked Glacier and Yellowstone national parks as their primary attractions. Of all the types of attractions in Montana, mountains, Glacier and Yellowstone national parks, rivers, open space, and wildlife were the top six, respectively (Parrish et al. 1997, Dillion and Nickerson 2000). The net benefits of wolf recovery alone were estimated at $10 million per year (Duffield et al. 1993).

In 1999, these attributes attracted 9.4 million visitors to Montana who spent an estimated $1.6 billion on goods and services. Expenditures increased about 4% over 1998 amounts. Since 1991, expenditures increased 2-7% each year, except 1996. Tourism is directly responsible for 30,000 jobs in Montana (6% of all jobs in the state) and supports thousands more indirectly (Cheek and Black 1998). Nonresident travel is an important part of the state's economy, on par with agriculture in terms of employment, and the wood products industry for total income (Cheek and Black 1998).

In Minnesota, wolf-related ecotourism has grown significantly. Similar growth may be possible in Montana. Already in Montana, guiding and outfitting services for nature tours, wildlife observation, wildlife photography, and "outdoor adventures" have grown in popularity. In fact, the employment growth of Montana's amusement and recreation industry is outpacing all the other travel-related industries (Dillion and Nickerson 2000). The presence of wolves diversifies the opportunities associated with this type of economic activity.

CHALLENGES OF WOLF PRESENCE IN MONTANA

Biological

One of the most fundamental challenges of wolf recovery and restoration is the uncertainty of the outcome, as a large carnivore that has been missing for decades resumes its functional role in the ecosystem. Biologists could only predict the effects of restored wolf populations on prey populations or other wildlife based on what was known from other places. It appears that many of the original predictions about the reintroduction to the GYA and central Idaho were accurate, at least in the short term (Bangs et al. 1998). However, it remains to be seen whether those predictions will be accurate over the long term.

The uncertainty about the nature, cause, magnitude, and mechanisms of wildlife population fluctuations is further complicated by the presence of wolves. The last time wolves were present with high prey densities, bison still roamed the Great Plains. Today, wolf-prey relationships are influenced by many factors, including habitat modification by humans, land management activities, changes in prey species distribution and numbers, economics, and social and political factors -- all of which, in and of themselves, are highly dynamic. Predator-prey relationships have been studied extensively; yet the results of each study are unique to the study area, and the conditions prevailing at the time the research was conducted (e.g. predator species present, predator density, prey species present, prey density, winter severity etc.).

How predator and prey populations respond to MFWP management activities is also uncertain. The history of wildlife management includes many examples of new approaches that grew out of experience and information gained along the way

Social, Cultural, Aesthetic

The challenge of the next decade will be how to manage the wolf, having been largely successful in saving the species from extinction in the lower 48 states (Mech 1995). The greatest challenges associated with wolf management often come from social and political issues rather than biological issues. Fritts et al. (1994) speculated that perhaps no other wildlife species is as affected by human perceptions and attitudes as the gray wolf.

Experience in Minnesota demonstrates that active management of wolf numbers and distribution is a necessity, given their reproductive potential and dispersal capabilities. It is unrealistic to expect that wolves could exist in 21st century settings as they did in at the time of Lewis and Clark. Management, including lethal removal, is necessary to address and reduce conflicts with livestock and humans, as well as to have a cost-efficient program (Mech 1995, Mech 2001). However, the same public sentiments that promoted wolf recovery and protection often oppose management and lethal removal of wolves (Mech 1995). This irony has led many wolf experts to emphasize the need for a balanced public outreach program that incorporates wolf control as a part of any wolf restoration program (Fritts et al. 1995).

In contrast, some livestock organizations and hunting advocates in the northern Rockies spoke out against wolf recovery and restoration efforts in the GYA and central Idaho, as well as against the legal protections afforded wolves by the ESA (USFWS 1994b). Opposition stemmed from concerns about wolf depredations on livestock and the associated economic losses, loss of management flexibility by federal land management agencies, land-use restrictions, impacts to big game populations, and reduced hunting opportunity. Despite many legal challenges, wolves were released. The USFWS worked to increase the tolerance and acceptance of wolves by those who expressed the greatest opposition or who would be affected the most by wolf presence. Resolution of conflicts in a safe, efficient manner was a priority. Upon delisting, Montana will face similar challenges.

Public opinions in Montana vary greatly. We have a dispersed rural population, an urban population concentrated in a few populous counties, an economy in which agriculture ranks among the top 3 industries, and expanses of public land that could support wolves. The spectrum of human values and attitudes about wolves ranges from total protection of the species to total elimination. These values are highlighted by urban and rural differences, by differences between residents of Montana, Idaho, and Wyoming and the national public, and by differences in the knowledge and understanding of wolf biology and the education of individual respondents (USFWS 1994a). These differences in values, attitudes, and opinions create a challenging environment in which to manage a controversial species.

Economic

One economic challenge of wolf presence in Montana stems from the real and perceived imbalance between the economic and social costs experienced by individuals, businesses, organizations, or agencies most directly affected by wolves and the economic and social benefits that accrue to those less directly affected. The costs and benefits do not accrue equitably to the same individuals, businesses, organizations, or agencies.

The USFWS predicted that some segments of the economy would be negatively affected and others would be positively affected by wolf restoration in the GYA and central Idaho (USFWS 1994a). Negative costs were predicted for livestock producers who experienced wolf-related livestock losses and for hunting-related businesses. Positive economic benefits were expected for businesses related to tourism, outdoor recreation, and national park visitation.

Individual producers may experience significant direct and/or indirect economic impacts due to wolf presence or depredation (Bangs et al. 1998). In the GYA and central Idaho recovery areas to date, confirmed wolf-caused livestock losses have been less than predicted (Bangs et al. 1998). Predictions were not made for the Northwestern Montana Recovery Area, although there has been at least one depredation event in every year except one, from 1987-2000. Producers could have other losses beyond what is confirmed and documented. Since 1987, a privately funded program paid a total of $150,000 for confirmed or highly probable wolf-caused livestock losses in Montana, Wyoming, and Idaho (Bangs and Shivik 2001). It is difficult to estimate the economic losses due to unconfirmed livestock losses or the indirect economic costs associated with wolf presence or depredation.

For hunting-related businesses such as outfitting, economic losses may be associated with decreased hunter opportunity or fewer recreational days afield, which ultimately may reduce hunter expenditures or participation rates. Ultimately hunter opportunity will probably fluctuate as predator and prey populations change through time. In northwestern Montana, prey populations declined in one hunting district on the western border of GNP after wolves established. This was due to the combination of predation by all carnivores in the area, intermittently low recruitment of fawns and calves, possible overharvest of antlerless elk, and natural mortality caused by severe winters (Kunkel et al. 1999, T. Thier pers. comm.). Similar decreases were observed in the elk population in the South Fork of the Flathead River, an area devoid of wolves during most of the same period (J. Vore pers. comm.). In that drainage, overharvest of antlerless elk was a contributing factor.

Although ecotourism is touted as a viable, sustainable way of generating economic activity through "low-impact" use of natural resources, ecotourism has potentially negative consequences. Risks to resources include increased infrastructure development, habitat degradation, wildlife disturbance, increased demands, and an erroneous perception that ecotourism leads to long-term protection of environmental assets (Isaacs 2000).

The State of Montana must also secure adequate financial and personnel resources to implement a wolf conservation and management program. While many aspects of this program fall within existing duties and activities already carried out by MFWP, some components clearly add to existing responsibilities and workloads. Existing budget and personnel resources cannot absorb this expansion. Other state and federal agencies will be similarly affected. The responsibility to address the economic challenges of wolf conservation and management resides with all interests.

WOLF CONSERVATION AND MANAGEMENT

Introduction

Montana's wildlife legacy includes a rich diversity of species. Throughout its 100-year history, MFWP has actively restored, perpetuated, and managed the fish and wildlife resources of the state. Some activities promoted wolf recovery, such as careful ungulate population management, research, and monitoring, the acquisition of Wildlife Management Areas (WMAs), purchase of conservation easements, and other efforts to preserve and restore wildlife habitats.

In keeping with the stewardship principles extended to other species, MFWP will conserve and manage wolves in concert with the rest of our wildlife heritage. These stewardship principles embody the ideals of conservation, implying the long-term persistence of wolves. Active management will also be required to address conflicts between wolves, people, livestock, and other wildlife species. Conservation and management are not mutually exclusive concepts. When taken together, our direction is to integrate and sustain wolves in suitable habitats within the complex biological, social, and economic landscapes using a variety of management tools. MFWP is committed to achieving this balance. In conjunction with our neighbors, Idaho and Wyoming, we will sustain wolf populations at secure levels which prevent reclassification under ESA.

In taking a balanced approach between conservation and management, MFWP will bring the gray wolf into the existing management framework, programs, and policies for other carnivores, such as mountain lions and black or grizzly bears. Even though black and grizzly bears are omnivorous, for the purposes of this plan, they are functionally included in the carnivore group with lions and wolves because of their predatory capabilities. Although each of these species is biologically unique, there are common threads to how they are managed. Elements of the gray wolf program will also overlap other existing programs, such as ungulate management and research, habitat, public outreach, law enforcement, and private landowner relations. A successful conservation and management program for wolves ultimately depends on people and their attitudes. An information and education program is discussed in a separate chapter.

Adaptive Management

MFWP's wolf program will be based on principles of adaptive management. Adaptive resource management provides a framework and a process for decision-making, which aligns management objectives and constraints, even when the outcome is uncertain. Decisions are based on current and future status of the resources. Through time, experience and knowledge accumulate. Research and management are conducted simultaneously in a coordinated fashion that improves management (Lancia et al. 1996).

An adaptive management program has 4 components: objectives, management alternatives, predicted outcomes of management activities (models), and a monitoring program. Initially, objectives are established. Next, a management alternative is selected from a range of liberal to conservative strategies and implemented. The monitoring program measures the outcomes and detects any changes. Measured outcomes are compared to the predicted outcomes, and the model is refined to more closely match what actually happened. Then, another management alternative is selected and implemented. Management actions change through time based on current resource status and how that compares with the original objectives.

Wolf Population Objectives

Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. If each state were to sustain an equal number or ten pairs each, the biological intent of the recovery plan would be met -- so long as wolves were well distributed across the region. Based on ten years of experience in northwest Montana, not all packs are successful each and every year, 14-17 packs would be needed to achieve the minimum number of 10 breeding pairs with at least two pups on December 31 (USFWS unpubl. data). Montana will maintain at least 14-17 packs statewide. Given an average pack size of 5-7 members, between 70 and 119 wolves would be present in Montana, at the minimum. Montana habitats have the potential to support more than 17 packs, and there will be no administrative limit imposed on total pack numbers. MFWP does not administratively declare an upper limit or maximum number of individuals of any wildlife species in the state in the

context of a "cap." Instead, MFWP identifies population objectives that are based on landowner tolerance, habitat conditions, social factors, and biological considerations. Wildlife populations are managed according to the objectives and population status, using a range of management tools. A wolf MFWP will document, monitor, and manage all wolf packs within available habitats according to the adaptive management principles and conflict resolution tools described in this plan.

These population objectives identify a minimum number of packs that will meet the legal requirements. We assume that additional packs will become established and the actual number of packs in Montana when wolves are officially delisted will be above the minimum recovery criteria. As the number of packs varies through time, adaptive management principles come into play. Management strategies and conflict resolution tools will be more conservative as the number of packs decreases, approaching the legal minimum. In contrast, management strategies become more liberal as the number of packs increases. Ultimately, the wolf population itself identifies the appropriate management strategies. A wolf population of 15 packs is not considered a minimum or a maximum allowable number of packs. Rather, the value of 15 is used to signal a transition in management strategies from liberal to conservative, as the number of packs changes. The threshold of 15 packs was determined by examining the reproductive histories of the packs with the longest tenure. The Interagency Technical Committee also deliberated this value. It was ultimately recommended to the Council and formally endorsed.

Animals dispersing into Montana from YNP, central Idaho, and Canada will supplement the Montana wolf population. Similarly, Montana wolves will disperse out and supplement other populations. In the end, some or all packs are transitory. In order to maintain wolves at or above the recovery criteria, new packs must be able to replace those that die out or are eliminated. In the long run, exchange of wolves between and among the three areas will help ensure that minimum population objectives are met. Wolf population trends in the three recovery areas from 1987 to 2000 are shown in Figure 3.

Wolf Distribution

Nationally and within Montana, people have demonstrated a strong interest in restoring the gray wolf to its former historic range. Yet there have been dramatic changes in the landscape since wolves roamed Montana at the turn of the 20th century. Human settlement, the introduction of livestock and agriculture, and the current abundance and distribution of native ungulates make for a dramatically different landscape for wolves in the 21st century.

Due to the magnitude of these changes, the federal gray wolf recovery team identified areas with large tracts of public lands and adequate native prey as suitable habitats for wolf restoration. These were remote federal lands, designated wilderness areas (e.g. the Bob Marshall complex), and national parks. The recovery plan emphasized these areas because of the lower potential for conflict with livestock and people (USFWS 1987).

However, wolves in Montana readily use altered landscapes, even demonstrating preferences for low elevation agricultural or commercial timberlands. Federal lands at low elevations are typically managed for multiple uses and are intermingled with privately owned lands, resulting in a checkerboard pattern of mixed land ownership. When combined with the geography in Montana, approximately the western half of Montana provides suitable wolf habitat in the 21st century. Wolves exist within a full array of backcountry wilderness areas, multiple use lands, intermingled public and private lands, and wholly private lands.

Wolves can exist in many different habitats. However, wolf distribution in Montana will ultimately be defined by the interplay between ecological needs and social tolerance, as is the case for many other wildlife species such as deer, elk, bears, and mountain lions (Decker and Purdy 1988, Fritts and Carbyn 1995, Bangs et al. 1998, Riley and Decker 2000). People have different tolerance levels, values, and attitudes about wildlife and large carnivores in particular. Furthermore, tolerance varies in space and time and at different scales.

Social acceptance of wolves transcends the boundaries of geography, land ownership, or land use designations just like a pack territory boundary transcends those same delineations. An adaptive approach will help MFWP implement its wolf program over the range of social acceptance values now and in the future as values change.

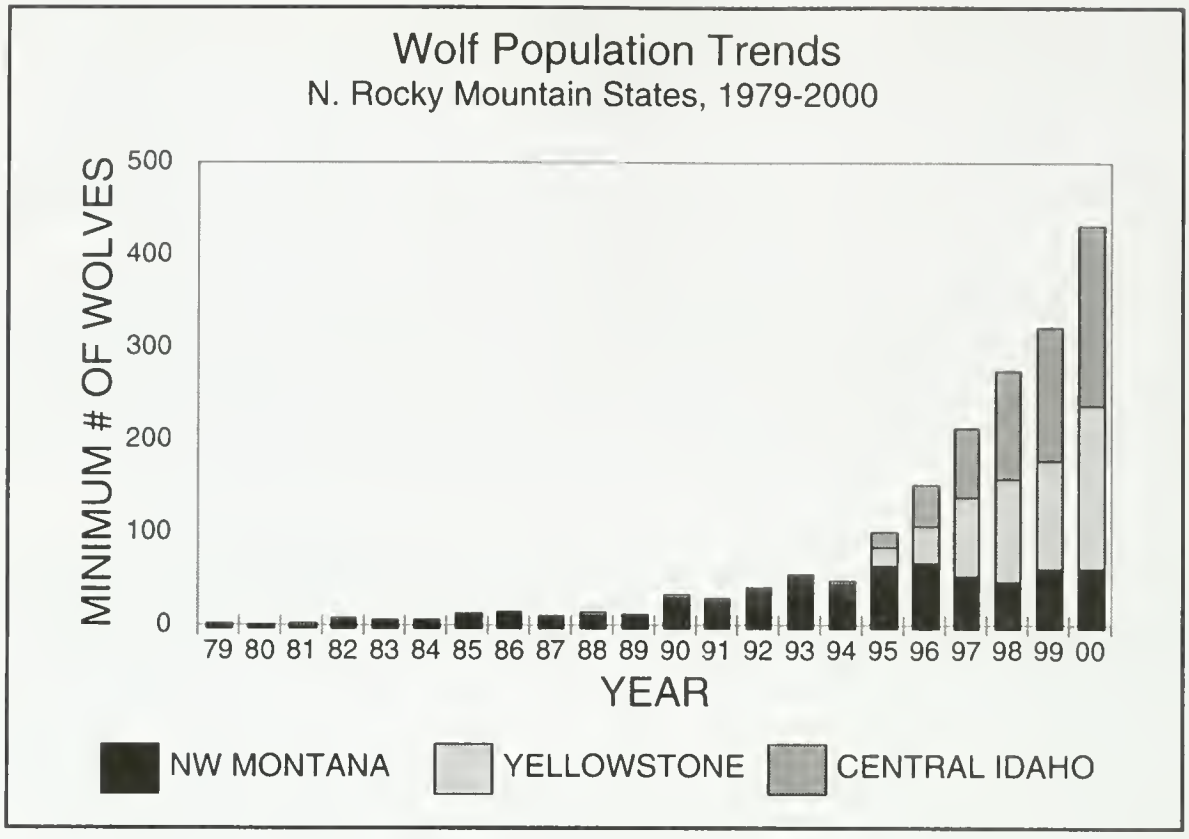

Figure 3. Grey wolf population trends in the Northwest Montana, Greater Yellowstone, and central Idaho recovery areas from 1979-2000. (Source: USFWS et al. 2001)

Present wolf distribution in Montana is presented in Figure 2. MFWP anticipates that wolf distribution will evolve through time due to the interplay of ecological needs and social tolerance. It will most likely comprise western Montana. Even in western Montana, wolf distribution will be discontinuous compared to the more homogeneous habitats and continuous wolf distribution typical of the upper Midwest. The distribution of deer and elk populations in high enough densities to support wolves is discontinuous because of marginal habitat conditions for ungulates or concentrated human settlements in intermountain valleys. Although there is an adequate natural prey base to support wolf presence in eastern Montana, most of the land base is privately owned. Most of the public lands in eastern Montana are grazed by domestic livestock during some part of the growing season. The higher frequency with which wolves conflict with livestock on public and private land makes it unlikely that a wolf pack could be sustained over the long term. However, wolf distribution would not be artificially restricted if social tolerance permits wolf presence. Indeed, the general distribution of all wildlife species in Montana is determined through the interaction of species' ecological requirements and human tolerance, not through artificial restrictions. In the case of wolves, the existence of a privately funded compensation program has helped to increase social tolerance for wolves. This subject is discussed in a later chapter.

By not establishing administrative limits to wolf distribution, wolves could disperse and move freely between northwestern Wyoming, central Idaho, and Canada. The capability to exchange genetic material among the sub-populations in the region is an important underpinning of wolf recovery and is required for long-term population viability. The absence of any presupposed boundaries of wolf distribution provides maximum flexibility to MFWP to accommodate wolf presence, address public concerns, and meet public expectations.

Montana's wolf program will emphasize large contiguous blocks of public land, managed primarily as backcountry areas or national parks where there is the least potential for conflict, particularly with livestock. Wolf presence will be encouraged on these lands. The national public identifies very strongly with public lands in western states, and it desires that these lands be managed according to the broadest interpretation of "public benefits." The national public strongly supported wolf restoration in the GYA and central Idaho (Duffield et al. 1993, USFWS 1994b). However, Montanans' opinions were less supportive (Tucker and Pletscher 1989). Nonetheless, the Montana public may be more willing to accept wolves on these remote public lands, particularly if conflicts are minimal and problem wolves are managed. Management strategies employed in these habitats will be more conservative, favoring wolf presence.

Outside backcountry areas, Montana is extremely diverse. With the complex mix of differing prey bases, land ownership, land uses, social tolerance levels, and potential for conflict, all possible combinations exist. Each unique combination could be termed a management setting, which is the suite of characteristics for a particular area with regard to the biological and social characteristics, the physical attributes of the environment, land ownership, and land uses. Wolf packs in areas of interspersed public and private lands will be managed in ways similar to other free-ranging wildlife in Montana. The management strategies outlined in this plan will protect human safety, integrate the wolf program with other MFWP program areas, and minimize conflict with livestock. Management strategies employed outside of backcountry areas depend on wolf population status, type and severity of conflict, land ownership, and social tolerance. While this plan will guide MFWP, some agency discretion and flexibility will be exercised to accommodate the unique attributes of each pack, its history, the site-specific characteristics of its home range, landowner preferences, or other factors that cannot be reasonably predicted at this time. Management flexibility will be crucial in addressing all of the public interests that surround wolves.

Population Management

The high reproductive potential and capability of wolves to disperse long distances make population management a necessity in many situations (Boyd and Pletscher 1999). Indeed, managing large carnivore populations is the next significant challenge beyond restoration (Mech 1995, Mech 1996, Mech 2001).

In Montana, the goal of wolf management is to balance wolf numbers and distribution within the constraints of the biological, social, and political landscapes. "Management" implies that cooperating agencies are actively engaged in activities which assure long-term population welfare and minimize the potential for conflict or resolve conflict where and when it develops. Agency actions are selected from a spectrum of possibilities and are aimed at matching the appropriate management tools to the situation. "Management" is not synonymous with lethal control. On the contrary, wolf population management will include the full range of tools from non-lethal to lethal and will incorporate other agency functions such as public outreach, conservation education, law enforcement, and landowner relations. Wolves do not exist in isolation from their environment, nor should an effective management program isolate wolves from their environment.

Management actions will be evaluated in light of prevailing conditions or extenuating circumstances. Wolf populations will fluctuate as a result of management actions, natural mortality, legal harvest, illegal take, wolf productivity, and ungulate population fluctuations. Taking all of this into consideration, specific management actions are guided by wolf population status, with a minimum of 15 packs required to use more liberal management tools. Liberal management tools include possibilities for lethal removal of wolves. If there are fewer than 15 wolf packs in the state, management tools are primarily non-lethal. Ultimately, under the statutory classification of "species in need of management" and in conjunction with the rules and regulations adopted by the MFWP Commission, wolves will be treated and managed like other wildlife species in Montana (e.g. big game, furbearers, or game birds).

Non-Lethal Methods

The intent of non-lethal methods is to avert or resolve a wolf conflict without killing the wolf or wolves in question. In many instances, non-lethal management tools effectively address the public or agency concern and are the most cost effective, least intrusive method. If successful, non-lethal methods may also alleviate the need for more intensive management actions in the future. Examples of non-lethal techniques include monitoring wolf locations using radio telemetry, changes in livestock husbandry practices, harassment of wolves, wolf relocation, or attempts

to modify wolf behavior. Non-lethal techniques specifically intended to modify wolf behaviors can be aversive or disruptive (Bangs and Shivik 2001). Aversive stimuli cause discomfort or pain to the animal after a wolf demonstrates certain behaviors. The repeated negative experience associated with certain behaviors may condition the animal to not repeat that behavior. Examples are taste aversion or electric shock collars. Disruptive stimuli attempt to prevent or alter behaviors by disrupting the animal when it behaves in undesirable ways. When disrupted by the stimuli, the animal is supposed to retreat. Examples are noise makers or siren devices triggered when a wolf approaches livestock too closely. The research arm of WS is actively investigating the utility and effectiveness of these techniques to avert wolf conflicts with livestock (Bangs and Shivik 2001). At present, these protocols are experimental and their efficacy is being evaluated.

MFWP will emphasize non-lethal management techniques if there are fewer than 15 wolf packs. Furthermore, in backcountry settings and for public lands near national parks, non-lethal methods will be preferred over lethal methods. In mixed land ownership patterns, non-lethal methods could also be used.

Livestock producers (or their agents) may non-lethally harass wolves when they are close to livestock on public or private lands. Private citizens may also non-lethally harass wolves that come close to homes, domestic pets, or people. The intent in allowing private citizens and livestock producers to non-lethally harass wolves is to avert a potential conflict by discouraging wolves from habituating to people or frequently visiting areas near livestock.

Sterilization procedures have some application for reducing wolf population increases under certain conditions (Haight and Mech 1997). Field-testing is currently underway in Alaska.

Lethal Methods

Wolf populations are strongly influenced by human-caused mortality. Wolves became extinct in Montana because of intensive human exploitation, and they ultimately recolonized after legal protections were instituted. Human-caused mortality still influences wolf populations today (Pletscher et al. 1997, Bangs et al. 1998).

Managing human-caused mortality will be an important component of wolf population management. However, MFWP management actions must also take into account other sources of wolf mortality that are beyond our ability to manage, such as car/train strikes. MFWP also recognizes that wolves may die because of illegal activities. The total of legal and illegal mortality, natural mortality, and random events will be the primary mechanism by which wolf numbers will change. Population monitoring will provide the necessary data on which decisions will be based, so that management can be adjusted accordingly without jeopardizing population welfare.

Legal Wolf Mortality -- Wolves could die in Montana for a variety of legal reasons.
Recent revisions to Montana statutes, which go into effect upon delisting, allow private citizens to kill a wolf if it is threatening human life or domestic dogs. Livestock producers or their agents could also kill a wolf if it is attacking, killing, or threatening to kill livestock – regardless of whether the incident takes place on public or private land. Any incident in which a wolf is injured or killed in defense of life or property must be reported to MFWP as soon as possible, but within 72 hours. The entire carcass must be returned to MFWP.

Upon confirming wolf depredation on livestock, WS may initiate lethal control actions subject to a Memorandum of Understanding between WS, MDOL, and MFWP. MFWP may also approve lethal control of the offending animal by livestock owners or their agents. A special kill permit (issued by MFWP) is required for any lethal control of any legally classified wildlife in Montana, unless there is an imminent threat to a person, dog, or livestock. If a wolf is killed on a special permit, the incident must be reported to MFWP as soon as possible, but within 72 hours. The entire carcasses must be returned.

MFWP intends to provide opportunities for regulated public harvest of wolves through hunting and trapping as the wolf population increases and it becomes appropriate to do so. Harvest management would proceed adaptively, but all hunting and trapping would be cease if wolf packs totaled fewer than 15. As the number of packs increases beyond 15, MFWP will assess population status and analyze potential management alternatives. A harvest-oriented alternative could be selected and the formal recommendations drafted. Then, MFWP solicits public comment on the proposal. A final recommendation is forwarded to the MFWP Commission for their consideration. This process would be similar to what is currently done for all other game or forbearing species. Through public input and

MFWP Commission oversight, harvest regulations would be established. Regulated hunting and trapping of wolves would take place within the larger context of multi-species management programs, rather than the context of single species management. As wolf numbers increase and distribution expands, harvest opportunity would increase. Specific harvest objectives will depend on other losses to the wolf population, such as control actions for livestock depredation or loss of a pack because of intraspecific strife.

Through annual MFWP Commission oversight and public input, hunting and trapping would take place under designated seasons and regulations which describe legal means of take, license requirements, and reporting and tagging requirements. Total harvest would be strictly controlled through a permit or quota system, with season closures as soon as harvest objectives are reached. Law enforcement by the MFWP Enforcement Division would also proceed similar to other managed wildlife species such as deer, with penalties for violations and restitution values established in Montana statute.

Fine scale population management would be achieved by the delineation of specific harvest districts with individualized harvest objectives. Wolves could be promoted (on remote public lands) or discouraged (in areas with high livestock densities) depending on harvest objectives, district boundaries, and pack distribution. Hunting is not permitted in national parks. Public harvest options would also considered in circumstances where a livestock producer has had problems with wolves harassing or killing livestock. In these circumstances, public harvest would be in lieu of a government control action.

There is a significant amount of published literature to assist MFWP as it initiates a public harvest program for wolves. Our Canadian neighbors manage wolf populations and address wolf conflicts using a diversity of management tools, one of which is a sustainable public hunting and trapping program – all in an environment very similar to Montana (Carbyn 1983, Bjorge and Gunson 1985, and Gunson 1992). All available information will be considered during the decision-making process.

Illegal Wolf Mortality -- Illegal wolf mortality occurs in Montana, despite the current protection of ESA. Some mortality was attributed to negative public opinions about the federal government's efforts to recover wolves, wolf activity in a new area, and public land management policies (Bangs et al. 1998). It remains to be seen whether illegal mortality will be a problem for future wolf populations managed by the state. Illegal mortality would result from public taking outside of the framework established by Montana statutes and MFWP Commission rules and regulations. Poaching, malicious killings, and mistaken identity losses would all be considered illegal. MFWP Enforcement Division will pursue cases of illegal wolf mortality, similar to other wildlife species.

Other Considerations

Trappers may incidentally catch a gray wolf in a trap or snare intended for other species. Trappers will be required to release the animal, if possible, and report the incident to MFWP. If the animal has debilitating injuries, the trapper must call MFWP for assistance and reporting.

Even though MFWP has a legal requirement to maintain at least ten packs, the wolf population could decrease to below or near recovery goal targets through an unpredictable combination of natural events and management actions. Within national parks, wolves will always be legally protected from intentional human-caused mortality beyond the context of a management removal. As long as wolf populations remain secure and viable, Yellowstone and Glacier national parks will be a source of dispersing wolves to reoccupy vacant habitats outside park boundaries if the Montana population decreased to levels near or below recovery goals. If population trends could not be reversed by conservative management strategies, MFWP would consider transplanting wolves into Montana from other secure populations. In reverse, a secure wolf population in Montana could serve as a source of animals for future restoration efforts elsewhere such as Colorado, where preliminary work documented that wolves could be sustained biologically (USFWS 2000). Transplanting wildlife to augment populations is a management tool that MFWP used to restore ungulate populations in the 1940s and 1950s and uses now for bighorn sheep.

Population Monitoring

For the first five years after the gray wolf is delisted, MFWP is required to document that the wolf population is at or above the relisting criteria. Beyond the legal requirement, MFWP will want to include wolves in the long history of

collecting survey and inventory data on fish and wildlife populations. These data create the foundation upon which all wildlife populations are managed. MFWP recognizes that beyond its legal requirement for population monitoring, its own interests are well served by collecting scientifically credible data. A thorough database will lead to the successful integration of the wolf program with other wildlife programs so that all may be managed in an ecological context.

The wolf monitoring program should document population status and trend through time. Specific objectives will be to estimate wolf numbers, document reproduction, and tabulate mortality. These data will yield a general demographic picture of the Montana wolf population. Additionally, information about wolf pack distribution, individual territory boundaries, how a pack moves through and uses its territory, locations of wolf den and rendezvous sites, and interactions between packs would be generated. Dispersal information could also be gathered. Special management needs, opportunities, and constraints could also be identified. Periodic review of these data by MFWP and its sister agencies in Idaho, Wyoming, or other cooperators will ensure that corrective measures are taken in a timely fashion if the regional population is in jeopardy.

Although the primary wolf monitoring responsibilities will rest with MFWP upon delisting, we benefit from the knowledge generated by the efforts and experiences of the wolf recovery program cooperators (NPS, WS, Nez Perce Tribe, USFWS, US Forest Service, universities, and private organizations). MFWP activities will be integrated into the regular program of work. A detailed database will assist MFWP in coordinating various wildlife program efforts. Although MFWP personnel will carry out the primary monitoring duties, opportunities for collaboration with other agencies, universities, non-profit organizations, volunteers, and tribal wildlife authorities will be pursued. Collaborative efforts could be necessary in the future as wolf numbers increase and distribution expands geographically across land management agency jurisdictions and Indian reservations. Partnerships will also improve the cost effectiveness of fulfilling Montana's responsibilities.

The monitoring program will balance scientific precision with cost effectiveness. Costs of data collection typically go up in proportion to their precision and the rigor required from the data. Financial and personnel limitations may sometimes preclude the most precise, reliable techniques. MFWP will rely on a combination of radio-telemetry and non-invasive techniques. The monitoring program will require greater accuracy and precision when there are 15 or fewer wolf packs. As the number of wolf packs increases, the need for precision decreases proportionally.

Some radio collars deployed by the USFWS will still be functioning when the state assumes management authority. MFWP will continue to monitor these existing collars and selectively deploy additional radio collars during the first five years after delisting. We will focus on newly formed packs about which little is known. We may also radio collar wolves which become available opportunistically. It will be important for MFWP personnel to gain knowledge and experience with wolves and for these skills to accumulate as rapidly as possible. Telemetry techniques will generate baseline information efficiently and help biologists learn about wolves. As knowledge and experience increase, MFWP will decrease reliance on telemetry and incorporate more non-invasive methods for basic survey and inventory data collection. Wolves captured while addressing conflicts will be radio collared prior to release.

The term "non-invasive" monitoring implies that information can be gathered without actually live-capturing and handling animals. Examples of non-invasive methods are track counts, howling surveys, observation report summaries, remote photography, and profiling of genetic material obtained passively from hair or scat samples. These methods can yield valuable information; however, for some monitoring objectives, validation using a radio-collared wolf pack is required for accuracy.

Track counts are most efficiently conducted during periods of snow cover. Track surveys could confirm presence or absence of wolves. If they are intended to estimate pack size, they must be done repeatedly to yield accurate information because wolves will literally step in each other's footprints while traveling in groups. MFWP presently conducts winter ground tracking surveys in a systematic fashion for furbearers using snowmobiles (MFWP 1995). US Forest Service (USFS) personnel also assist with these surveys. Wolf tracks are periodically encountered (B.Giddings pers. comm.). Existing routes may be adjusted to include the lower elevations frequently used by wolves in association with ungulate winter ranges. Separate routes, specifically intended for wolves, may also be established within pack territories, as they become known.

Wisconsin created a volunteer carnivore survey program in which interested members of the public do snow track surveys (Wisconsin Department of Natural Resources 1999). Participants, trained by the Wisconsin Department of Natural Resources, survey an assigned area several times a winter and forward their data in the spring. Volunteers did the surveys reliably and logged several thousand miles each winter. The method and program are still being validated with more intensive telemetry data, but it appears promising as a monitoring tool and it facilitates public involvement with wolf management issues (Wisconsin Department of Natural Resources 1999). Alaska conducts winter track surveys using aircraft. This method may be appropriate for some Montana packs.

In the late spring and summer months, howling surveys at rendezvous sites can help biologists determine whether a pack is raising pups. Pup vocalizations can easily be discriminated from adults. Although a precise count is usually not possible, wolf responses can indicate relative pack size. Since different packs react to artificial howls differently, howling surveys may not work in all cases.

Observational reports were useful to the federal wolf recovery program. Repeated observations of animals and/or sign in an area led to the discovery of new packs. Observational reports may also confirm pack persistence. Since it proved so valuable to the federal program, MFWP will add the gray wolf to its own Occurrence/Distribution Report and Track Observation Report forms (MFWP 1995). Similar information could also be gathered using hunter/trapper contacts (e.g. check stations or log books), the MFWP web site, Regional Headquarters offices, and the telephone harvest survey program.

MFWP biologists use remote photography to sample a variety of species. This technique could also be used to survey wolves on known travel routes to or from den or rendezvous sites or in conjunction with bait or scent stations.

Genetic profiling is the identification of unique individual wolves by analyzing genetic material isolated from cells extracted from hair, blood, or muscle tissue. Samples are obtained from wolves – either passively or from live-captured animals, yielding a unique genetic pattern similar to human fingerprints. Other information, such as maternity, paternity, dispersal, or overall genetic diversity can also be analyzed. A reservoir of genetic samples obtained from wolves in Montana, central Idaho, the GYA, and adjacent Canadian source populations already exists. MFWP will supplement the genetic database as samples become available.

Anecdotal information will supplement formalized monitoring protocols. Depredation investigations by WS yield important information, such as documenting wolf activity in a new area or the number of wolves involved in an incident.

Each monitoring protocol has its own advantages and disadvantages. No single method will be suited to all packs, either. MFWP will consider any and all methods, including new methods as they are developed. Corroborating evidence will be gathered using multiple methods, but specific protocols will be tailored to the pack, setting, and appropriate season for collecting that type of data. This will facilitate a balance between monitoring responsibilities, information needs, cost effectiveness, and scientific rigor.

Wolf Health and Disease Surveillance

Several diseases and parasites have been reported for gray wolves in the lower 48 states. Some had significant impacts on population recovery, especially for wolves in Minnesota, Michigan, and Wisconsin (USFWS 2000). However, in the northern Rockies, diseases and parasites were less influential and have not significantly impacted wolf populations to date (USFWS 2000). Nonetheless, adult wolves die from a wide variety of canid diseases or parasites. Pups may be especially vulnerable to death from exposure to canine parvovirus or canine distemper (Mech and Goyal 1993, Johnson et al. 1994). Monitoring and surveillance of wolf health will provide baseline information. Even though monitoring and surveillance would not stop a disease or parasite related decline, it could demonstrate a possible reason for the decline.

Wolf health is monitored by analyzing biological samples collected from dead and live-captured animals. During live capture operations, overall wolf health will be assessed, including presence of external parasites. Blood will also be collected. Blood tests can indicate exposure to canine parvovirus, distemper, and other potentially detrimental diseases. Necropsies will be performed on wolf carcasses to determine cause of death, condition, age,

reproductive status, and food habits. General protocols will be followed to collect reproductive tracts, stomach and colon contents, muscle tissue for genetic purposes, and any potentially diseased or parasitized tissues. Other sampling or testing may be conducted, depending on the request or concerns of the submitting party and the condition of wolf remains.

Carcasses and biological samples will be submitted to the MFWP Wildlife Laboratory in Bozeman. If warranted, tissues may be collected and forwarded to other laboratories for any specialized testing or forensic investigations. The Wildlife Laboratory will be the primary repository for stored samples and necropsy data, as is the case for some other species. Through time, baseline data will be compiled, which prove invaluable in the long run. As baseline data accumulate, the value of doing routine necropsies may diminish with time, and the submission of carcasses will be reduced to special forensics or disease-related cases. Increasingly, these functions are shared with the Regional Wildlife staff. Today's computer technologies enable locally collected data to be systematically collected and made available to MFWP personnel statewide. As these applications are further developed and refined, less responsibility will be borne by the Wildlife Lab and more will be borne in the Regions. MFWP will continue informal consultation and cooperation with the Wolf Project in YNP or other wolf researchers and managers.

In the unlikely event of human injury or death during a wolf-human encounter, the wolf or wolves will be lethally controlled and the carcasses forwarded to the MFWP Wildlife Laboratory. Carcasses will be tested for rabies or other pre-disposing health factors. If a wolf bites a person during a capture and handling incident, a blood sample will be drawn so it can be tested for rabies.

Wolf Specimen Disposition

Montana statutes permit citizens to possess the parts (antler, bone, skull, hide etc.) of lawfully taken big game, game birds, furbearers, and fish or the parts of animals that died of natural causes. Possessing parts of animals that died illegally or of unnatural causes is not permitted. For example, a citizen could pick up the antlers of an elk that died from starvation but could not cut off the antlers of a deer recently hit by a car. Wolf carcasses and parts will be discovered by or otherwise become available to the general public for a variety of reasons, including natural mortality, accidental death, agency control actions, defense of life or property, and regulated public harvest. Rules and regulations adopted by the MFWP Commission will govern possession of wolf parts. The general rule of thumb is that it is not legal to possess parts of legally classified wildlife unless there are provisions for a regulated public take – i.e. hunting regulations in the case of big game, trapping regulations for furbearers, or special regulations written for species in need of management. Possession and transport of gray wolf parts is also subject to the Convention on the International Trade in Endangered Species (CITES), similar to the bobcat and river otter (*Lutra canadensis*). The hides of bobcats, river otters, and wolves must be marked with a special tag. Tags are obtained from MFWP and are only affixed to animal hides taken by legal means. It would be illegal to possess a wolf, bobcat, or river otter hide without the CITES tag.

Any wolf carcass found in the field should be left alone and reported to MFWP. In the short term, MFWP or WS will conduct a field investigation and retrieve the carcass as a precautionary measure for public safety. In Idaho, nine wolf carcasses in the last two years were discovered on national forest land. The USFWS National Forensics Laboratory confirmed that these wolves were poisoned with Compound 1080, banned by the Environmental Protection Agency in 1972. This poison is extremely dangerous to human health, and no antidote exists. All carcasses, including those resulting from WS control actions or private actions through defense of life or property, will be transferred to the MFWP Wildlife Laboratory. A wolf database will be created and maintained. Eventually, the public will be able to keep wolf parts, consistent with the laws governing possession of other classes of wildlife species, such as big game or furbearer.

The entire carcass of wolves killed by private individuals in defense of life or property will be returned to MFWP and remain state property, regardless of whether the incident occurred on public or private lands. Upon confiscation, carcasses resulting from illegal killings also remain the property of MFWP.

If the hide, bones, and/or skull are in good condition, they can be salvaged and used for educational purposes. Priorities will be for research purposes, tribal cultural use, and general wolf education. These specimens may be transferred to other government agencies, non-profit organizations, tribal authorities, or educational institutions for general public benefit. Parts unsuitable for educational uses will be destroyed.

Research

Wildlife research in Montana is conducted by MFWP and through its cooperative partnerships with universities, non-profit organizations, tribes, and federal agencies. Permits to conduct research, particularly if live capture is required, are issued by MFWP to ensure that the work is scientifically justified and conducted in an ethical, responsible manner.

Research by MFWP and its partners will be an important component of the wolf program. Previous work on wolves in Minnesota, Alaska, or Wisconsin took place in settings and environments that are different from Montana. Although previous research findings will be applicable to some degree, wolves in the northern Rockies likely interact with their environments and their prey populations differently. This information will be important for sound policy formation and decision-making.

The Council identified a need for improved understanding of predator-prey relationships in Montana. Montana is home to a full spectrum of large carnivores that prey on ungulates. These same ungulate populations are also managed to sustain regulated public hunting and wildlife viewing. The dynamics of predator-prey systems are highly fluid and vary by the type of carnivores and ungulates present. Other environmental factors also influence the dynamics.

MFWP has been involved in cooperative research efforts with the University of Montana, Montana State University, USFWS, USFS, National Park Service, private landowners, and others. Ongoing investigations into the dynamics of wolf – elk interactions in the GYA are comprehensive. The broad scale approach will allow comparison of wolf predation and elk distribution for elk herds subjected to wolf predation only, elk herds subjected to human hunting only, and elk herds subjected to both wolf predation and human hunting. Research into other aspects of wolf ecology in YNP and central Idaho is ongoing. Investigations of the interactions between wolves, mountain lions, and grizzly bears are also underway. These efforts will result in an increased ecological understanding of wolf-ungulate interactions.

MFWP is also interested in evaluating specific management actions as to their efficacy and projected outcomes. This will be accomplished through a combination of the monitoring program within the adaptive management model and research efforts to evaluate management strategies or specific actions across all numbers of wolf packs and management settings.

Because the attention people pay to wolves is not balanced with the relatively minor impact wolves have on the lives of most people, wolf management will probably remain complicated, expensive, political, and controversial (Bangs et al.1998). Nonetheless, human attitudes are an important indicator of public support for wolves. Ultimately, positive human attitudes must be maintained in order to sustain a viable wolf population. Finally, human dimensions research could yield information about the attitudes and opinions of Montanans about wolves. This insight will help MFWP identify problems or areas of public concern so that we can target our work more effectively. There may be supplemental or alternative approaches to the coexistence of wolves and humans that do not require the direct manipulation or removal of wolves, as was identified for cougars (Riley and Decker 2000). New research needs may develop in the future.

Habitat Management

General

Ungulate distribution and human settlement patterns largely define wolf habitat. MFWP ungulate programs link habitat and population management through hunting to achieve ungulate population objectives. One keystone of MFWP's habitat program is Habitat Montana, which focuses on land conservation initiatives to benefit wildlife and maintain other natural resource values of private lands. The Forest Legacy Program is another habitat program for private forested lands. MFWP owns and manages a network of WMAs across the state to benefit wildlife (wintering ungulates in particular) and public recreation. By incorporating habitat elements within its ungulate program, MFWP is already taking the habitat needs of wolves into consideration. Our work, along with the amount of land held in public ownership, provides long-term habitat availability for wolves. Federal land management agencies are

increasingly managing lands from an ecosystem-level perspective, considering all components and functional relationships.

MFWP manages ungulate populations by balancing natural population fluctuations with public hunting. By definition, MFWP manages ungulate populations with the long-term welfare of the resource as the foundation. By maintaining healthy ungulate populations, MFWP assures that adequate prey will be available to sustain a wolf population.

In its downlisting proposal, the USFWS (2000) concluded that there were no foreseeable habitat-related threats or reasons to suspect a significant decline in native ungulate populations that could jeopardize a recovered wolf population. MFWP agrees with this conclusion and believes that its comprehensive ungulate program substantiates that finding.

Travel/Access Management

The responsibility for managing human access and travel on public lands resides with the administering land management agency, whether state or federal. Human access can be managed by time period (e.g. seasonal closures) or by localized area restrictions. Outside of Yellowstone and Glacier national parks, most federal lands utilized by wolves are administered by the USFS. The USFS manages access and motorized travel to meet management objectives or legal requirements. NPS restricts motorized travel to paved routes only, while foot/horse travel is permitted most places. In some circumstances, even foot travel is restricted due to seasonally imposed closures in areas of concentrated wildlife activity. MFWP closes most of its WMAs to human access during the winter period to prevent disturbance to wintering ungulates.

Wolves do not demonstrate any particular behavioral aversion to roads. In fact, they readily travel on roads, frequently leaving visible tracks and scat (Singleton 1995). New wolf activity is often confirmed in an area by searching roads for wolf sign. Research in the upper Great Lakes states examined road densities and wolf activity. In those flatter, more homogeneous habitats, wolves existed in higher densities in areas with lower road densities (Mech et al. 1988, Wisconsin Department of Natural Resources 1999). It would be difficult to extrapolate those results to our region because of differences in human population densities, habitat characteristics, and land physiography. The underlying concern about road density in the northern Rockies stems from the potential for illegal killing (Boyd-Heger 1997, Pletscher et al. 1997). Most researchers agreed that increased road densities reduced wolf survival (see summary in Boyd-Heger 1997). In the mountainous landscapes of the northern Rockies, wolves selected areas that were lower elevation, flatter, and closer to roads (Boyd-Heger 1997). However, an increased probability of human-caused mortality was associated with increased road use by wolves (Boyd-Heger 1997).

Whereas MFWP has and will continue to consult with land management agencies about access and travel management, MFWP has no legal authority to implement access or travel restrictions on land it does not own. Presently, there are no restrictions on road use or road-density on USFS or U.S. Bureau of Land Management lands due solely to the presence of wolves. Upon delisting, MFWP does not anticipate a need to suggest amendments to federal or state travel plans because of wolf activity. MFWP would encourage land management agencies to continue their assessments of habitat security for all wildlife species. Changes in this policy do not appear necessary. Some wolf packs outside national parks have private lands within their home ranges. Land-use or travel restrictions are not necessary for private lands, either.

Connectivity

Connectivity implies that wolves in each of the three states are functionally connected through emigration and immigration events, resulting in the exchange of genetic material between sub-populations. This functional relationship is consistent with the biological intent of the recovery plan and is an underlying prerequisite for successful wolf recovery in the northern Rockies. MFWP supports the continued recognition of functional ecological relationships by land and wildlife management agencies, private landowners, and conservation organizations.

Designation of actual habitat linkage zones or migration corridors is impractical for a habitat generalist and highly mobile species like the gray wolf. Between the mid 1980s and the late 1990s, about half of the packs recolonizing northwestern Montana did so outside of the anticipated recovery area and linkage corridors suggested in the recovery plan (Forbes and Boyd 1997, USFWS 1999). It appears that overall management for wolf survival across broad landscapes already used by wolves is more important than discrete corridors because of the dispersal rates and distance capabilities (Fritts and Carbyn 1995). Outside refuges such as national parks, legal protection and public education across broad landscapes will facilitate those functional connections across the region (Forbes and Boyd 1997). Yellowstone and Glacier national parks function as refuges at opposite ends of the geographic extent of wolf distribution in the northern Rockies. The network of public lands in western Montana, central Idaho, and northwest Wyoming facilitates connectivity between the sub-populations. The legal protections and public outreach described in this plan help ensure the integrity of wolf movement between refuges. No specific linkage corridors are proposed in this plan.

Sufficient dispersal and exchange of wolves between the three sub-populations will be necessary to maintain the high degree of genetic variation of a regional wolf population. In isolation, none of the three recovered populations could maintain its genetic viability over the long term (USFWS 1994a). Isolation is unlikely if populations remain at or above recovery levels and regulatory mechanisms prevent chronically low wolf numbers or minimal dispersal (Forbes and Boyd 1997).

Human settlement patterns, disjunct concentrations of wild ungulates, and diverse geography make it unlikely that wolves will ever be continuously distributed throughout the tri-state region. MFWP recognizes the imperative that wolves move within and between islands of occupied habitats. By default, dispersing wolves will travel through some habitats that are unsuitable for long-term occupancy because of the potential for conflict. Wolves will be permitted to move through these areas as long as they do not threaten public safety. Particular deference will be granted if the number of wolf packs is 15 or less. Relocation would be a potential management tool if continued presence is undesirable.

Wolf Den and Rendezvous Sites

Wolves respond differently to human disturbance (Claar et al. 1999). Differing responses were due to a variety of factors, including the individuality of wolves, the particular setting, and whether the population is exploited or protected (Ballard et al. 1987, Mech et al. 1998, Thiel et al. 1998). In some instances, wolves moved pups after human disturbance, but pup survival was not affected (Ballard et al. 1987). It also appears that pups are not moved over long distances (Thiel et al. 1998).

National Forest land managers in Montana have not instituted area closures or travel restrictions specifically because of localized wolf activity. Human recreational use of these lands is often of a dispersed, sporadic nature. Area closures around den or rendezvous sites in national parks are sometimes instituted because of high visitation numbers and the strong public desire to view wolves. The areas around dens in YNP are closed until June 30. Currently, there are no local area closures in GNP.

MFWP is not recommending any localized closures near wolf den or rendezvous sites on public lands outside national parks. In fact, an early survey in northwestern Montana indicated that public support to recover wolves would dwindle if recreational or commercial uses of public lands were restricted to promote recovery (Tucker and Pletscher 1989). The researchers did not quantify how rapidly public support would erode if changes in recreational or commercial uses were implemented. To date, they have not appeared necessary and they probably will not be in the future as wolves expand their distribution and increase in number. However, MFWP encourages land management agencies to consider the locations of wolf den and rendezvous sites and habitat security in their future planning activities in the same context as considering the locations of ungulate winter range or bald eagle nests. Ultimately, land management agencies may adopt seasonal or area restrictions independently from MFWP.

Captive Wolves and Wolf-dog Hybrids

The number of captive-reared wolves and wolf-dog hybrids in the U.S. could be as high as 400,000 (Hope 1994). Hybrids result from the breeding of *Canis lupus* with domestic dogs (*C. familiaris*), resulting in variable combinations of physical traits and behaviors. Much of the normal predatory behaviors of wild wolves disappeared

in domestic dogs. But the predatory instincts are still present to an unknown and unpredictable degree in wolf-dog hybrids. Although hybrids commonly lack a fear of humans, the animals are generally poorly adapted as domestic pets because their behavior is unpredictable and their response to general obedience training is poor. While the keeping of captive wolves and hybrids as pets is rewarding to some individuals, others find it unmanageable and try to find new homes for their pets. Hybrids have been released into the wild, presumably by frustrated owners. In Wisconsin, the frequency of wolf-dog hybrid encounters with humans or pets increased concurrent with increases in wild wolf numbers. From 1989 to 1998, there were 21 incidents involving 44 different released captives or hybrids, 33% of which were in 1998 alone (Wisconsin Department of Natural Resources 1999). The potential for genetic pollution of wild populations, human safety, and erosion of public acceptance for wild wolves are commonly cited problems with private ownership of captives or hybrids or release in the wild.

In the northern Rockies, the concern about genetic pollution is overstated. At present, there is no genetic or other evidence that captive wolves, wolf-dog hybrids, domestic dogs, and coyotes interbred with native Rocky Mountain wolves in the wild (Boyd et al. 2001). Wolves and coyotes can be easily differentiated genetically. However, genetic tests currently cannot distinguish between wild wolves, domestic dogs, and wolf-dog hybrids. Because domestic dogs evolved from wild wolves, they have similar genetic characteristics. It is unlikely that a released captive or wolf-dog hybrid would survive long enough to reproduce with wild wolves (Bangs et al.1998).

There are behavioral differences between wild wolves, wolf-dog hybrids, and captive wolves. Released captives and hybrids will typically associate with humans and loiter near human settlements. They may even be more likely to depredate domestic animals than wild wolves (Bangs et al. 1998). In the tri-state area, wolf-dog hybrids have been found in the wild sporadically since at least 1986 (Bangs et al. 1998). Two cases in 1997 were south of YNP. In each case the animal loitered on private property, scavenged, and one killed domestic sheep. Both animals were euthanized. Methods to distinguish non-native wolf-like canids from native wild wolves include a combination of genetic analyses, morphology, and behavior. Basic morphological differences between wild wolves and wolf-dog hybrids in the Great Lakes region are described by Duman (2001).

MFWP is concerned about the potential for captive wolves or wolf-dog hybrids to compromise human safety if they are released or escape from their owners. Wolf-dog hybrids have been responsible for human attacks, maulings, dismemberments, and deaths. Many incidents involved children. The animal's large size, lack of fear, and unpredictable behavior make it especially problematic. As of 1997, the Food and Drug Administration had not approved rabies or other vaccines for use with captives or hybrids. Despite lack of approved vaccines, many captive wolf or hybrid owners use the standard dog rabies vaccine. Nonetheless, there is still concern for public safety because vaccination status may not be known.

Wildlife professionals sometimes have trouble distinguishing a captive-reared wolf or a wolf-dog hybrid from a wild wolf. It is even more difficult for the general public. Negative experiences with rogue captives or hybrids can taint future public opinions about wild wolves and undermine tolerance for wild, free roaming wolves that normally fear humans.

It is legal to possess captive wolves and wolf-dog hybrids in Montana. Citizens may keep them as personal, private pets without a permit. Citizens wishing to publicly display captives or wolf-dog hybrids or to attract trade must have a permit from MFWP. Montana statutes (87-1-231) and administrative rules require the permanent tattooing of any wolf held in captivity, where "wolf" means a member of the species *Canis lupus*, including any canine hybrid which is one-half or more ($\geq$ 50%) wolf. Owners are also responsible for compensation and damages to personal property caused by any wolf that is held in captivity or that escapes from captivity. MFWP Enforcement Division maintains the database of tattooed captive wolves and wolf-dog hybrids.

At this time, MFWP does not seek to further regulate the ownership of captive wolves or wolf-dog hybrids. However, the State of Montana may seek statutory authority to do so in the future in the interest of public safety. There is a federal court ruling from a 1998 case in Mississippi upholding that state's ability to exercise legislative powers to determine and act on behalf of the safety interests of its citizens.

Upon delisting, MFWP will respond to incidents of free-ranging captive wolves or wolf-dog hybrids. WS, local animal control officers, or other law enforcement officers may also respond. If these animals loiter near people, their homes, or compromise public safety, they will be lethally removed. Incidents involving human injury will be

treated as if the animal were wild and non-vaccinated. MFWP assumes that at the time of delisting, wild wolf populations could sustain the removal of an occasional wild wolf mistaken for a released captive or wolf-dog hybrid. Free-roaming captives or hybrids captured at livestock depredation sites will be euthanized if attempts to locate the owner are unsuccessful. If the owner can be located, the animal will be returned, but its owner is financially responsible for compensation for damages or losses.

The MFWP Commission may consider adopting rules and regulations that prohibit the general public from removing wolves or wolf pups from the wild.

Ecotourism

With enhanced marketing, ecotourism associated with the gray wolf is a potential area for economic growth in Montana. In Ely, Minnesota, visits to the International Wolf Center generate approximately three million dollars in economic benefits to the local economy (Mech 1996). Now that the Discovery Center in West Yellowstone exhibits captive wolves, similar outcomes could be predicted for that community and the GYA. Over 9.4 million nonresidents visited Montana in 1999, up from 9.2 million in 1998. Glacier and Yellowstone national parks attract the most visitors to Montana and wildlife viewing is the most popular recreational activity (Dillion and Nickerson 2000).

YNP will probably continue as the primary destination for wolf-related ecotourism. While NPS strictly regulates commercial activity within parks, the surrounding public lands or other public lands in Montana could be alternative destinations for commercial guiding services for wolf viewing. Commercial activities on USFS lands are regulated through an internal permitting process. MFWP generally does not permit commercial use of its WMAs or State Parks. However, MFWP does welcome the general public to view wildlife on these lands.

While the ecotourism potential of wolf-related activities is significant, there could also be adverse effects, too. Increased human knowledge of wolf den and rendezvous site locations or increased visitation may lead to problems with chronic disturbance, premature home site abandonment, habituation, or even increased illegal mortality. The biological impacts of recreational or ecotourism-induced disturbance (e.g. howling) are difficult to predict for wolves because of the behavioral plasticity demonstrated by the species. General considerations are presented by Claar et al. (1999).

The Montana Department of Commerce's Board of Outfitters and the federal land management agencies are the licensing and oversight authority for commercial outfitting and guiding services in Montana. However, MFWP will promote ethical approaches to ecotourism through educational materials and through its partnerships with federal agencies and private non-profit organizations. Non-profit groups, such as the Timber Wolf Alliance, developed guidelines for ethical approaches to wolf watching and howling sessions in the Great Lakes states (Wisconsin Department of Natural Resources 1999). These materials could be readily adapted for use in Montana.

Law Enforcement

Since wolves will be classified as a "species in need of management" upon delisting, the MFWP Commission will establish rules and regulations pertaining to wolves, including the conditions and circumstances under which a private citizen may harass, kill, or possess a wolf. The MFWP Law Enforcement Division enforces those rules, along with other Montana statutes related to wildlife and human safety. MFWP enforcement personnel will coordinate with federal, local, and or tribal authorities as necessary.

The enforcement of new rules and regulations for wolves in Montana will be a high priority. Law enforcement authority for wolves as a "species in need of management" will be similar to other legally classified game or fur bearing species. Game wardens will go about their routine duties much as before, only there will be additional rules and regulations, specifically pertaining to wolves. These will be adopted by the MFWP Commission. Warden patrol duties and call-out response will be adjusted to include wolf responsibilities and duties. MFWP has a 1-800-telephone hotline (TIP-MONT) so that people could anonymously report observed or suspected violations of fish and wildlife or parks laws. This is an important tool for game wardens to receive information and respond to public requests. We anticipate that the public may also use the hot line to report possible illegal activity concerning wolves.

After an investigation, violations of the statutes, rules, or regulations will be prosecuted in cooperation with the county or district attorney for state or federal cases, respectively. In cooperation with the Courts of Limited Jurisdiction, penalties and restitution will be established for unlawful takings and rule violations. While Montana's penalties may not be as substantial as the penalties for violating ESA, they will be commensurate with other wildlife species to discourage criminal activity, particularly repeat offenses.

MFWP field wardens, biologists, or wildlife conflict specialists may respond to and resolve wolf-human conflicts. This is consistent with statutory responsibilities conferred upon MFWP for resource protection and public safety.

Generally, MFWP wardens will not investigate wolf-livestock conflicts, unless WS agents request field assistance. But wardens may assist landowners in contacting WS in cases of suspected depredation. When WS closes an investigation, MFWP wardens may help process field reports on suspected wolf depredation or transport carcasses similar to the current procedures for mountain lion, black or grizzly bear investigations. Montana statutes assign authority to MFWP and the MFWP Commission to issue special kill permits to landowners that enable a person to kill a wolf under specified conditions. Game wardens (or biologists) will have the primary responsibility for the field aspects of administration, implementation, and closing these cases.

Public education is a critical component of a successful law enforcement program. Significant public outreach is required to inform the public about the rules and regulations pertaining to wolves during the transition from federal to state management. The public will need to develop an awareness of the transition in management authority and the new rules and regulations. MFWP has many outlets to convey information, all of which will be utilized. See Appendix 8.

Implementation

Table 1 summarizes a spectrum of MFWP and WS strategies to manage and conserve wolves in Montana. Many activities fall within existing duties and responsibilities already carried out by MFWP or WS, but some activities clearly add to existing responsibilities and workloads. Some wildlife biologists, for example, will have new wolf monitoring responsibilities. Some segments of the public will expect the same intense level of monitoring and wolf control currently carried out by the USFWS and WS. MFWP field wardens will now investigate potentially illegal wolf mortalities. Other changes for wardens and/or biologists may include; working with landowners to address their concerns, handling/referring livestock damage calls, responding to wolf sightings and perceived threats to public safety, addressing hunter concerns and complaints associated with wolves, and responding to reports of injured or road-killed wolves. The MFWP Wildlife Laboratory will experience an increased workload associated with processing wolf carcasses, fulfilling wolf health and disease surveillance responsibilities, and filling educational requests. Other state and federal agencies could also be affected similar.

Additional resources will be required to implement these new responsibilities. Existing budget and personnel resources cannot absorb this expansion. Additional funds will be necessary for field-level and administrative personnel, technical training, public outreach efforts and materials, new equipment, and for daily operations to monitor wildlife populations or deliver an adequate public response to concerns about public safety. All interests share the responsibility of addressing the economic challenges of wolf conservation and management.

A draft budget is presented as Appendix 3. The budget outlines the personnel and financial resources necessary to fulfill the wolf monitoring responsibilities, disease surveillance functions, law enforcement, information and education initiatives, program administration, and WS activities carried out under the terms of the MOU. The budget truly reflects the comprehensive nature of designing and implementing a wolf management program. While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation . Some components of the wolf program may not be captured fully by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. This budget will be refined in the future as MFWP gains more experience with wolf management. MFWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources. Adequate funding will be necessary to fully implement the wolf conservation and management provisions of this Chapter.

Interagency, Interstate, and Tribal Coordination

In the North American model of wildlife conservation, the states have almost sole authority over wildlife management, except for federal trust species (e.g. migratory birds or ESA listings), reserved federal lands (e.g. national parks), or Native American treaty rights. On tribally owned lands, the tribes maintain wildlife management authority. Because of the unique history and relationships between federal and state governments, tribes, the public, and wolves, restoration in the northern Rockies required the participation of all parties. It will take a high degree of cooperation and commitment among all parties to sustain the population.

Table 1. The spectrum of management activities to manage and conserve wolves in Montana. The adaptive management model calls for selection of different management strategies as the number of wolf packs changes from less than 15 to 15 or greater. The different management settings (Public Lands and Mixed Land Ownerships) call for different strategies, depending on landownership patterns, social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of wolf packs or management settings, as indicated by the right arrows.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ **15 Packs or Greater**	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish, Wildlife & Parks Conservation and Management Strategies	Adaptive management	→	→	→
	Integrate with ungulate management	→	→	→
	Health and disease surveillance	→	→	→
	Population monitoring	Enhanced population monitoring	Limited monitoring to determine pack status	Enhanced monitoring in selected areas
	Research to improve [illegible] wolf-ungulate interactions	→	→	→
	Research to evaluate specific management actions	→	→	→
	Law enforcement, high priority	→	Law enforcement	→
	Public outreach to inform and address specific needs	→	→	→

Table 1. Continued.

Table 1. Continued.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ 15 Packs or Greater	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish, Wildlife & Parks	Interagency, tri-state coordination →		→	→
	Summarize annual mortality; track pack numbers using USFWS definition →		Summarize annual mortality; track pack numbers using combination USFWS definition and other techniques	→
	Ensure human safety; discourage wolf habituation →		Discourage wolf habituation; more proactive removal of potential problem wolves	→
	No regulated hunting and trapping	No regulated hunting and trapping; licensed sportsperson may be used to resolve conflict w/ livestock in lieu of government response	Regulated hunting and trapping w/ MFWP Commission oversight; conservative harvest on quota or permit system w/ mandatory reporting	Regulated hunting and trapping w/ MFWP Commission oversight; harvest on quota or permit system w/ mandatory reporting; harvest quota more liberal as pack #s increase
Wildlife Services Management Strategies	Incremental approach, conservative →		Incremental approach; lethal removal of problem wolves more liberal	Incremental approach; lethal removal may be 1st, especially on private land
Private Citizens	Non –lethal harassment →		→	→
	Lethal take in defense of life/property →		→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. Since not all packs successfully breed and have pups every year, Montana will maintain at least 14-17 packs statewide to insure achievement of a minimum number of 10 breeding pairs with at least two pups on December 31.

Individually, the states of Idaho, Montana, and Wyoming will be responsible for wolf conservation and management within its own borders. But collectively, it is in the best interests of all three states for wolf populations to remain secure within the region. If the regional wolf population falls below the relisting criteria, legal protections and management could revert back to the federal government. The State of Montana also recognizes the ecological and cultural significance of wolves to Native Americans and encourages their participation within the tri-state region.

To meet the goals of the wolf program, interstate coordination will require that field personnel exchange biological data. Important issues will include the population status and trend within each state, the disposition of cross-boundary packs, and whether there are foreseeable problems with achieving the goals and objectives. Information will also help states improve techniques and monitoring protocols. Collaborative research projects at regional scales may also be developed, coordinated, and implemented. Periodic administrative coordination will also be required. Collectively, this will facilitate a problem-solving atmosphere for issues that are common to all parties.

Within Montana, interagency coordination between MFWP, WS, and MDOL at the programmatic and field levels will be necessary to successfully implement the plan. At the field level, biologists and game wardens will need to work closely with the WS agent in their area to achieve a timely and appropriate management response, as well as ensure accurate record keeping. Moreover, collaboration at the field level can be beneficial to achieve management or research objectives with greater efficiency on a variety of topics, such as remotely triggered deterrent devices or trapping methods. At the programmatic level, coordination is required to develop a Memorandum of Understanding between MFWP, MDOL, and WS which will outline the responsibilities and activities of each agency, as well as how the agencies will coordinate decision-making.

PREY POPULATIONS: CONSERVATION AND MANAGEMENT

Introduction

Wolves return to a highly modified environment and a managed system. The success of major predators like mountain lions or wolves and human hunters rests on the same foundation: the productivity and perpetuation of deer, elk, and moose populations. As a result, the effects of predators on prey populations were some of the greatest concerns expressed by the public about wolf recovery in the northern Rockies (USFWS 1987, 1994a,b). The financial investments and sacrifices made by the hunting public to restore ungulate populations are significant. Safeguarding those investments for present and future generations is an important priority for many of Montana's citizens and MFWP. MFWP seeks to maintain the public's opportunity to hunt a wide variety of species under a variety of circumstances, and to do so in a sustainable, responsible manner.

Predator – Prey Interactions

All wildlife populations are inherently variable through time and across a diversity of habitats. The idea of population stability is a misnomer. Rather, populations fluctuate through time and are influenced by a variety of environmental factors that also change through time. Management may affect some factors but not others, and at best only moderates the fluctuations. Regardless, management programs should recognize that predator-prey interactions are another natural factor affecting ungulates and one that will also change through time.

Published literature on predator-prey interactions is highly varied in its conclusions about the ability of predators to influence prey populations or *vice versa*. There have been almost as many different interpretations of predator-prey interactions as there have been studies reported. This is to be expected because of the variety of different ecosystems studied, the assortment of predator and prey species under study, and the different management actions carried out. Additional difficulties arise out of the short-term duration of many studies compared to longer-term habitat changes, measurement of insensitive variables, poorly designed monitoring protocols, or too many simultaneous activities confounding data measurements and interpretation. Correlation between two variables does not necessarily imply a cause and effect relationship (National Research Council 1997). Results may not be appropriately applied in a different setting. Predators and prey interact with one another within the context of a particular environment, given unique habitats, weather patterns, species diversity, animal densities, and management framework. Each published report must be interpreted within the context of the conditions prevailing at that time.

Some research has shown that predation may influence prey populations through changes in recruitment, adult mortality, or a combination of both (Gasaway et al. 1992, Ballard et al. 1997, Kunkel and Pletscher 1999, National Research Council 1997, Mackie et al. 1998, Ballard et al. 2001). Increased adult female mortality from other sources, such as hunter harvest or elevated overwinter mortality, may create conditions in which predation can limit ungulate populations or slow population growth (Kunkel and Pletscher 1999). However, some biologists reported that habitat and climate influenced deer populations more strongly than wolf predation (Wisconsin Department of Natural Resources 1999). In Minnesota, wolves do not appear to impact white-tailed deer populations, although there may be more localized effects (Mech and Nelson 2000, Minnesota Department of Natural Resources 2001). Recent findings in Yellowstone National Park indicate that winter severity has a dominating influence on wolf predation patterns on elk (Mech et al. 2001)

Generating an understanding of population dynamics and the interactions of predator and prey populations may seem straightforward. In reality, however, it is extremely difficult. Theoretical models describe potential interactions, but most have underlying assumptions, which may or may not be true. Considerable technical challenges must be overcome to accurately assess how or to what extent any single factor influences populations. Trying to accurately assess how two or more factors might be interacting with each other is even more challenging. Documenting predation as a major limiting factor of ungulate populations requires intensive radio telemetry, manipulation of both predator and prey populations, measurement of environmental conditions, a well designed monitoring program, and a sustained long-term effort. Interactions between populations and with their physical environments are also difficult to measure and interpret. Systems with multiple large carnivores, including wolves, are even more challenging.

This plan is not meant to provide a comprehensive summary of predator-prey interactions or wolf predation on ungulates. However, some of published scientific literature reviewed for this document, is listed as a partial bibliography in Appendix 4. Our understanding of how ungulates, wolves, other carnivores, and their physical environments interact in Montana will develop through time.

Adaptive Management

Ungulate management in Montana balances many factors, including population welfare, habitat condition, landowner tolerance, hunter opportunity, and the environmental factors influencing populations. Ungulate populations are managed in a comprehensive, ecological way. The precision with which MFWP manages ungulate populations is not intended to mitigate the impacts of single limiting factor such as wolf predation, lion predation, or other mortality sources in and of themselves. Instead, ungulate populations are managed by taking into consideration a variety of factors. Since elk, white-tailed deer, mule deer, and moose are the primary prey species of wolves in Montana, MFWP will consider wolf predation, along with the other factors, so that ungulate populations are managed in a comprehensive, ecological way.

MFWP adopted an adaptive management program for mule deer and informally applies adaptive management strategies to elk, white-tailed deer, and moose management. The goal of the MFWP deer program is to manage for the long-term welfare of Montana's deer resource and provide recreational opportunities that reflect the dynamic nature of deer populations (MFWP 2001). Management decisions are based on the welfare of the deer resource first and recreational opportunities are provided consistent with the dynamic nature of deer populations. The goal of the elk program is to maintain elk populations in a healthy and productive condition and to cooperate with public and private land managers in the management of elk habitat. MFWP strives to provide diverse recreational hunting opportunity, diverse viewing opportunities, and for general public enjoyment (MFWP 1992). Moose are managed by similar philosophies.

To proactively balance and integrate management of ungulate populations and the factors that influence them (including wolf predation), hunter harvest opportunity for ungulates may be adjusted. Hunter opportunity already changes in response to previous hunter success, hunter participation rates, or even access to private lands. Hunter opportunity also changes in response to environmental events that affect ungulate populations such as drought, severe winters, or poor recruitment. The presence of wolves within the yearlong range of a specific ungulate herd adds another factor for consideration among all environmental and human-related factors. MFWP acknowledges that changes in hunter opportunity may affect outfitters and non-resident hunters, in addition to resident hunters.

If a local prey population is significantly impacted by wolf predation in conjunction with other environmental factors, MFWP would consider reducing wolf pack size. If there are fewer than 15 wolf packs in the state, relocation to backcountry areas would be preferred. Suitable habitats within mixed land ownerships could also be sought out to fill in habitats between YNP and GNP, as socially acceptable. If there are more than 15 packs in the state, MFWP will reduce wolf pack size by regulated hunting or trapping. Wolf management actions would be paired with other corrective management actions to reduce ungulate mortality or enhance recruitment, such as reducing human hunter opportunity for ungulates. Concurrent management efforts for wolves and ungulates would continue until the prey population rebounded, recognizing that by the time prey populations begin to respond they may be influenced by a new set of environmental factors.

MFWP hosts meetings to gather input and comments from the public about proposed hunting regulations for ungulates and other managed species. MFWP will need to enhance the amount and type of information it provides regarding ungulate and carnivore population status and trends, as well as the possible implications of various management options. It will be important to allow the public to properly weigh the alternatives and provide meaningful feedback to MFWP about their preferences.

Monitoring

MFWP regularly surveys ungulate populations across a spectrum of their habitats, using a variety of techniques. Precise survey objectives vary by species, location, and season. Information gathered from live populations is also supplemented by harvest information gathered at hunter check stations or through the telephone harvest survey. Ungulate monitoring efforts will be enhanced where wolf packs are established.

Habitat

MFWP recognizes that ungulates and carnivores depend on a sustained, productive land base –both public and private lands. Habitat management prescriptions that enhance habitat for ungulates will ultimately benefit human hunters and wolves. Subject to landowner tolerance, MFWP will continue its efforts to enhance wildlife habitats on private lands. MFWP will also coordinate with public land grazing permittees and federal or state land management agencies to address conflicts between ungulates and domestic livestock.

Research

Predator - prey population dynamics are complex and knowledge about those relationships is incomplete. Long-term research will enhance understanding of those relationships and lead to more effective management. MFWP does not have the financial resources to initiate a long-term comprehensive ecological study of wolf-prey interactions independently. MFWP will participate and support research efforts by other collaborative partners, including universities, NPS, USFS, USFWS, WS, Idaho, Wyoming, and neighboring Canadian provinces. For example, the NPS began studying predator and prey populations in YNP before wolves were reintroduced. After reintroduction, ongoing research expanded to include wolves within YNP and now, outside YNP. MFWP is a partner in ongoing research into elk-wolf relationships in the Gallatin and Madison mountain ranges. These efforts will result in an increased ecological understanding of wolf-ungulate interactions. We will apply research findings from other areas as appropriate and address information needs specific to MFWP ungulate management programs as resources allow.

MFWP is also interested in evaluating specific management actions as to their efficacy and projected outcomes. This will be accomplished through a combination of the monitoring program within the adaptive management model and research efforts to evaluate management strategies or specific actions across all numbers of wolf packs and management settings.

Implementation

Table 2 summarizes a spectrum of MFWP management activities to maintain viable prey populations. Many activities fall within existing duties and responsibilities already carried out by MFWP, but some activities clearly add to existing responsibilities and workloads. For example, some wildlife biologists may have increased ungulate monitoring responsibilities or more frequent coordination with landowners. Most importantly, biologists and game

wardens will have increased public outreach responsibilities where wolves are established. Additional resources will be required to implement these new responsibilities because existing budget and personnel resources cannot absorb this expansion.

A draft budget is presented in Appendix 3. The budget outlines the personnel and financial resources necessary to fulfill the need for enhanced ungulate monitoring where wolf packs become established, for the programmatic integration of ungulate-carnivore management, and for the associated public outreach. It also reflects the comprehensive nature of designing and implementing a wolf management program. While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation. Some components of managing prey populations to sustain a regulated hunting season for a wide variety of ungulates in a wide variety of circumstances and predation by wolves may not be fully captured by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. This budget will be refined in the future as MFWP gains more experience. MFWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources. Adequate funding will be necessary to fully implement the provisions of this Chapter.

WOLF – LIVESTOCK CONFLICTS

Introduction

Agricultural roots in Montana run deep. The earliest European settlers brought farming traditions and livestock with them. Montanans have been raising livestock for at least four generations. Agricultural heritage is woven through Montana's cultural fabric, just like our wildlife heritage. The rural characteristics of one affirm the other.

Farming and ranching in Montana maintains open space and helps people experience a "Big Sky" feeling. That open space is also habitat for a diversity of wildlife species. Maintaining the land base for agriculture and wildlife habitat is an increasing challenge, given broader trends inresource and agricultural economics, human population demographics, and development of the "New West" (Riebsame 1997). Sixty-nine percent of the human population growth in Montana from 1990 to 1997 was attributed to immigration (MFWP 1999). There are secondary benefits to a vigorous agricultural industry in Montana, including sustained economic activity in small rural communities, decreased rates of land conversion for subdivision and development, and maintenance of rural lifestyles.

Agricultural producers are usually interested in, proud of, and enjoy the wildlife associated with their properties, despite the occasional conflicts. The State of Montana acknowledges that wolves can create problems for some livestock producers. Financial losses may result directly from wolf depredation. Indirect costs may accumulate because of increased management activities or changes to agricultural operations. These financial hardships accrue to individual farmers and ranchers and may be significant to them. What makes wolf-livestock conflicts unique from other wildlife-livestock conflicts are the changes in the legal status of wolves. Historically, farmers and ranchers had the latitude to take care of problem wolves themselves. Since 1973, wolves have been legally protected. Regardless of historical events and how present circumstances came to be, the State of Montana acknowledges that tolerance for wolves on private property is fundamental to wolf recovery and maintenance. This is highlighted by the mixed land ownership patterns, geography, and wolf ecology.

Addressing wolf-livestock conflicts will entail two separate, but parallel elements. One element is the wolf management activities to minimize the potential for wolf-livestock conflicts and to resolve the conflicts where and when they develop. The management element primarily concerns the actions of state and federal agencies. Examples are providing technical assistance to producers, investigating complaints, and taking actions that reduce the probability that the offending wolf or wolves will be involved in another depredation incident. The management programs will be funded, administered, and implemented by the cooperating agencies. The second element addresses the economic losses when livestock are killed or injured by wolves or the proactive changes to husbandry practices that could be made if financial resources are available to help underwrite the changes. This element will be funded, administered, and implemented by a private party or otherwise independently of state and federal agencies.

Table 2. The spectrum of potential management activities to maintain viable populations of prey species Montana. The adaptive management model calls for selection of different management strategies as the number of wolf packs changes from less than 15 to 15 or greater. The different management settings (Public Lands and Mixed Land Ownerships) call for different strategies, depending on landownership patterns, social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of wolf packs or management settings, as indicated by the right arrows.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ **15 Packs or Greater**	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Montana Fish, Wildlife & Parks	Adaptive management	→	→	→
	Enhanced ungulate monitoring where wolves are present	→	Enhanced monitoring in selected areas	→
	Research to improve ecological understanding of wolf-ungulate interactions	→	Research to evaluate specific management actions	→
Conservation and Management Strategies for Prey Species	Habitat enhancement projects	Habitat enhancement projects with cooperating landowners	Habitat enhancement projects	Habitat enhancement projects with cooperating landowners
	Adjust hunter opportunity to enhance prey populations	Adjust hunter opportunity to enhance prey subject to landowner tolerance	Adjust hunter opportunity to meet prey population objectives	Adjust hunter opportunity subject to landowner tolerance
	Integrate ungulate and carnivore management	→	→	→
	Public outreach to inform and to address specific needs; Emphasize landowner relations	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. Since not all packs successfully breed and have pups every year, Montana will maintain at least 14-17 packs statewide to insure achievement of a minimum number of 10 breeding pairs with at least two pups on December 31.

The two elements, management and compensation, are funded, administered, and implemented separately and independently of one another -- but parallel one another, united in the goal of maintaining a viable wolf population and addressing wolf-livestock conflicts. The common goal links the two elements together and will foster collaboration among all parties. However, the decision-making process for each element could be independent from the other. For example, decisions about compensation could be made independently from how the cooperating agencies address problem wolves. Both elements are ultimately required, but the details and specifics about the nature of the relationship between agency management actions and compensation and how a compensation program could be designed and administered will be discussed later in this chapter.

It is Montana's intent to minimize the potential for wolf-livestock conflicts by proactively working with individual producers who could be disproportionately affected by wolf depredation. Upon delisting, MFWP will share responsibility with MDOL in managing wolf-livestock conflicts because Montana statutes assign responsibility to both agencies to manage wildlife causing damage to livestock. Even though Montana statutes will designate the gray wolf "in need of management" as a resident, native species overseen by MFWP, the wolf's ability to depredate on livestock and its unique historical relationship to agriculture also warrant the shared responsibility. MDOL and MFWP will work together, along with WS, to address and resolve wolf-livestock conflicts through a Memorandum of Understanding (MOU). Oversight is by the MFWP Commission and the Montana Board of Livestock. As conflicts arise under the state management program, resolution will be no less important or forthcoming. The framework for addressing wolf-livestock conflicts by the various agencies, livestock producers, and other citizens is described below.

Livestock Depredation

WS is a cooperating partner in the federal wolf recovery program with USFWS and has worked alongside the USFWS in investigating, documenting, and resolving wolf-livestock conflicts. WS agents gained significant experience with wolves in Montana and developed positive working relationships within the agricultural community. WS agents have investigated depredation complaints, captured wolves for research and monitoring purposes, provided technical assistance to producers, developed and tested non-lethal methods of depredation control, and removed problem wolves.

To date, almost all depredation incidents investigated by WS within Montana occurred on private land, whereas over 80% of depredations in Idaho and about 50% of depredations in Wyoming were on public grazing allotments (Meier in press). As wolf numbers and distribution increase in Montana, depredations may also occur on public grazing allotments or in remote backcountry settings. Between 300,000 and 400,000 sheep and cattle graze summer pasture on public lands in Montana (Bangs and Shivik 2001). It is not necessarily a foregone conclusion that wolves will automatically depredate on livestock, but wolf packs that regularly encounter livestock will depredate sporadically (Bangs and Shivik 2001). For example, the Ninemile pack in northwestern Montana regularly encounters livestock, but only depredated in three out of 11 years. But other packs attacked livestock not long after establishing a territory. Overall, livestock losses appear related to the availability of wild prey, increasing pack size, and the learned behavior of individual wolves. Research in a remote, mountainous allotment in central Idaho suggested that wolves tested and hunted cattle like wild prey, attacking the most vulnerable animals. Wolves killed calves that were the lowest weight, less guarded by people, nearest to an active wolf den, and in the heaviest forest cover (Oakleaf *in* Bangs and Shivik 2001).

In the northern Rockies, wolf depredation problems are more significant for sheep than cattle, which was also true historically. From 1987 to 2000, wolves accounted for the known loss of 148 cattle, 356 sheep, and 37 dogs in the states of Idaho, Montana, and Wyoming combined (USFWS et al. 2001). Between 1995 (the first year wolves were released into YNP and central ID) and 2000, an average of 21 cattle, 57 sheep, and 6 dogs were confirmed as wolf depredation per year within the three states combined (USFWS et al. 2001). Additional livestock losses may have been due to wolves, but these were not confirmed. Lack of evidence or the presence of conflicting or inconclusive evidence is problematic. Total carcass consumption by wolves is more likely than for other predators. Once abandoned, wolf kills are readily scavenged by other species. Appendix 5 summarizes confirmed wolf depredation data for the three recovery areas from 1987-2000. No estimate is available for unverified livestock losses that may have been due to wolves.

Wolves cause a small number of the total livestock losses in Montana compared to other sources of livestock mortality. Most sheep losses in Montana during 1999 were due to depredation by coyotes, disease, weather, and lambing problems. Most cattle losses in 1995 (most recent data available) were due to disease, calving, and, weather (Meier in press). Appendix 6 itemizes sheep and cattle losses by cause in Montana, as reported by the USDA Agricultural Statistics Service, Montana Field Office.

Nevertheless, wolf losses may be disproportionate to one or a few livestock producers because of where a wolf pack territory is established relative to livestock distribution, type of stock, and/or grazing practices such as turnout dates. Producers sometimes report missing livestock as suspected wolf depredation, but the loss cannot be confirmed. Sometimes a carcass is not found. In other instances, scavengers may have destroyed the evidence. Or, the evidence may be inconclusive because two or more carnivore species capable of killing livestock visited the site. In some circumstances, confirmed livestock losses may be a fraction of the total losses (Oakleaf *in* Bangs and Shivik 2001). In addition to livestock mortalities, producers have reported injured and stressed livestock, reduced weight gains, decreased pregnancy rates, and other complications when wolves are present. Issues such as unconfirmed losses, best management practices, or indirect effects on livestock productivity because of wolves warrant additional research. While MFWP is interested in this issue and would participate as a collaborative partner, it is unlikely that MFWP will be a major source of funding for such research.

Wildlife Services

WS, while not a resource management agency per se, is the federal entity routinely called upon by state and federal agencies as well as the private sector to provide operational and technical assistance to control damage caused by wildlife (Animal Damage Control 1994). WS is a work unit of the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture. Through a partnership between the USDA and state agencies or the private sector, WS engages in a wide range of damage management activities, including research, consultation, control of problem animals, technical assistance, and public outreach. Respondents in a recent national survey affirmed that society has a need and a right to control the damage caused by wildlife and that state and federal governments should play a role in meeting that need (Reiter et al. 1999).

Within Montana, WS is currently a signatory to an MOU with MDOL and MFWP to investigate depredations and conduct predator control for damage caused by wildlife other than wolves. Upon delisting, an MOU between MFWP and WS will be developed under which WS would also assist with wolf-livestock conflicts. The MOU will guide coordination and management activities among the three entities. MFWP, in cooperation with MDOL, will contract WS to respond to landowner or livestock producer wolf depredation complaints, to conduct field investigations, and to carry out management actions. WS will bring their expertise to the situation and resolve the conflict. WS will also make recommendations about the resolution of specific conflicts as well as ways of improving agency effectiveness and overall conflict resolution procedures. MFWP has the responsibility to provide guidelines to WS for capture operations and procedures and to identify the appropriate management actions – given the situation details and wolf population status. MFWP will also provide guidelines for reporting of investigative findings, management activities, and outcomes. MFWP has the ultimate responsibility for determining the disposition of wolves and will be guided by the strategies outlined in this plan. MFWP will also coordinate with other state or federal agencies as appropriate.

The MOU will also be a formal recognition and extension of the ongoing cooperation already taking place at the field level between WS agents and MFWP personnel in resolving wildlife damage caused by species other than wolves. In many cases, that cooperation proactively addresses conflicts through public outreach and technical assistance. The result is less damage to private property and the lethal removal of fewer problem animals. Examples include the MFWP conflict management specialists working on the East Front of the Rockies, the Greater Yellowstone Area, and northwest Montana. This cooperative spirit is already established and will be expanded upon for resolution of wolf conflicts.

Livestock producers should report any suspected wolf depredations (injuries or death) or the disruption of livestock or guarding animals to WS directly, as is the case for other wildlife species such as mountain lions. Any evidence at the scene should be protected from disturbance. WS will also investigate incidents involving domestic pets or dogs, guarding animals such as llamas, and alternative livestock. A rapid agency field response is imperative so that evidence may be examined as soon as possible after the incident. WS agents complete an investigative report form

summarizing the type and extent of damage, physical evidence, and a description of the site. This report is ultimately filed with MFWP. MFWP will establish a database to tabulate, summarize, and assess trends in wolf-livestock conflicts.

Based on the results of a field investigation, WS will determine if a wolf (or wolves) was involved in the incident and whether any livestock deaths or injuries could be confirmed as wolf-caused. If the investigating WS agent *confirms* that a wolf or wolves were responsible, subsequent management actions will be guided by the specific recommendations of the investigator, the provisions of this plan and by the multi-agency MOU. WS will be directed to take an incremental approach to address wolf depredations, guided by wolf numbers, depredation history, and the location of the incident. When wolf numbers are low and incidents take place on remote public lands, WS would use more conservative management tools. WS could select progressively more liberal methods as wolf numbers increase and for incidents on private lands. Conflict history of the pack, attributes of the pack (e.g. size or reproductive status), or the physical setting will all be considered before a management response is selected. Specific actions range from catch and release on site, to harassment on site, to relocation or lethal removal. Management actions will be directed at individual problem wolves to the extent that they can be identified and clearly implicated. Non-selective methods such as poison would not be used. If relocation is the preferred management action, backcountry areas or remote public lands are intended release sites, with concurrence from the land management agency. Mixed land ownerships may be selected, as socially acceptable. When wolves are killed by WS, their carcasses will be processed as described in the Wolf Conservation and Management Chapter.

In a proactive manner, WS and MFWP will also work cooperatively with livestock producers and non-governmental organizations to help minimize the potential of wolf-livestock conflicts developing in the first place. Technical assistance may take the form of guidance on carcass disposal, extra fencing, deploying scare devices, testing of developmental non-lethal control methods, or loaning of radio telemetry receivers so that landowners can monitor wolves in the vicinity of their livestock. In fact, two thirds of respondents in a recent national survey indicated that a combination of government agencies along with either the private sector and/or the injured party should share the responsibility in managing wildlife damage (Reiter et al. 1999). This type of collaboration is called for in this plan, with the parallel elements of management and compensation.

Livestock Producers

MFWP commends the patience of livestock producers and their willingness to provide access to their properties for representatives of WS, USFWS, and non-governmental organizations to address wolf-livestock conflicts while the wolves are federally protected. Indeed, this type of public-private cooperation provides a solid foundation from which the State of Montana will assume management responsibilities.

Livestock producers acknowledge a sense of responsibility for the welfare of the animals under their care. As a result, producers take many initiatives to help safeguard their livestock from depredation by carnivores, as an everyday practice. Examples include the use of guarding animals, fencing or otherwise securing animals at night, or hiring extra people to check on remote livestock. Government and private organizations should be encouraged to assist livestock producers and landowners in designing, implementing, or cost-sharing these proactive husbandry practices.

With technical assistance from WS, a producer may alter husbandry or management practices such as carcass disposal or otherwise secure livestock or sources of conflict. A recent evaluation of wolf depredations in Minnesota did not isolate any clear-cut attributes or management practices predisposing certain cattle operations to wolf depredation (Mech et al. 2000). But research in Kansas (coyotes and sheep) and Italy (wolves and sheep) did identify husbandry practices as a contributing factor in canid-sheep depredations (Robel et al. 1981, Ciucci and Boitani 1998). In the northern Rockies, field experiences of WS and USFWS personnel have shown that exposed carrion can attract wolves to areas where livestock are present, thereby increasing the encounter rate between wolves and livestock, which may ultimately lead to a depredation incident (Bangs and Shivik 2001). Additionally, sick, wounded, or small livestock (calves or sheep), seemed particularly vulnerable, especially in remote areas away from buildings and people. The abundance of natural prey, relative vulnerability of livestock, and nutritional demands of the wolf pack also appeared to affect how often wolves attempted to attack livestock (Bangs and Shivik 2001).

Individual livestock producers should be rewarded for taking voluntary measures to reduce the potential for wolf-livestock conflict. Examples include reducing conflict availability by altering turnout dates, type of livestock, or the timing of breeding/calving cycles. If problems are chronic, a livestock producer would have the option to move or receive payment from a private organization for retiring a public grazing allotment, with concurrence from the land management agency. Federal land management agencies do not have administrative or budgetary procedures to pay a producer to retire an allotment. Such funds must be secured from other sources. However, the federal land management agencies do have administrative flexibility to address chronic wolf-livestock conflicts by working with individual producers or grazing cooperatives to modify grazing practices to the mutual agreement and benefit of all interests.

Producers should also be rewarded for their willingness to cooperate in experimental protocols testing non-lethal management tools, such as scaring devices or noise-makers. Because wolves learn quickly and may habituate to certain management tools, no single non-lethal technique will work in all situations or for extended periods of time. The National Wildlife Research Center (the research arm of WS), in conjunction with other partners, has been actively developing and field-testing methods to discourage wolves from approaching livestock (Bangs and Shivik 2001). This work will continue in the future.

Despite our collective attempts to minimize the potential for depredation, livestock depredation will still occur. Livestock producers should have a quick and efficient means available to address wolf depredation problems, particularly if the incident occurs on private property. There will be a positive relationship between wolf numbers and landowner flexibility to address wolf depredations. As wolf numbers increase, landowner flexibility will increase proportionately.

Less than 15 Wolf Packs -- Landowners or their agents may non-lethally harass a wolf or wolves without a permit if wolves are disrupting livestock on public or private land. The intent is to discourage wolf activity in close proximity to livestock, before a depredation actually takes place and more intensive management actions become necessary. If repeated and persistent non-lethal harassment does not discourage wolves from chasing, testing, or otherwise disrupting livestock, the producer may contact MFWP to receive a special permit that grants permission to kill wildlife under certain circumstances and according to certain provisions. These are also called "kill permits." Montana statutes assign authority to MFWP for providing special kill permits to landowners. Administration and follow up is also a responsibility of MFWP. Permit holders will be held accountable for adhering to the terms of the permit. Existing statutes prohibit all citizens (including livestock producers) from taking legally classified wildlife outside a MFWP Commission-approved season, the provisions of a special kill permit, or in defense of life/property. Examples of some legally classified wildlife include deer, elk, mountain lions, upland birds, or wolves. Special kill permits would only be valid on private land and would be subject to other restrictions mutually agreed on by both parties. MFWP will issue fewer kill permits when wolf numbers are low, out of concern for overall wolf population status. If a livestock producer kills a wolf under the special kill permit, he/she should not move or otherwise disturb the carcass. After securing the scene, producers should then report the incident to MFWP, as soon as possible, but within 72 hours. Upon investigation, the entire carcass must be turned in to MFWP. Livestock producers will be held accountable for wolves in the same manner as for other legally classified species killed under a special permit.

Producers or their agents may also non-lethally harass wolves that disrupt livestock on public lands. MFWP will not issue special kill permits to livestock producers to remove wolves on public lands when wolf numbers are low. If non-lethal harassment does not discourage wolf activity around livestock on public lands, the producer or agent should contact WS for guidance and appropriate agency action.

If a depredation does occur on public or private lands, the producer should secure the scene and report the incident to WS, as they presently do for other predator-related livestock losses. Upon a field investigation, WS may consult with MFWP or initiate non-lethal or lethal control actions, as appropriate and according to an MOU between MFWP, MDOL, and WS.

Upon delisting, provisions of SB163 take effect. Producers (or their agents) can kill a wolf (without a special kill permit from MFWP) if the wolf is "attacking, killing, or threatening to kill" livestock, regardless of whether the incident takes place on public or private lands. This is consistent with the intent of allowing private citizens to protect persons or livestock from imminent danger caused by wildlife (Montana Statute 87-3-130). If a livestock producer kills a wolf under the defense of property provisions of SB163, he/she should not move or otherwise

disturb the carcass. After securing the scene, livestock producers should then report the incident to MFWP soon as possible, but within 72 hours. Upon investigation, the entire carcass must be returned to MFWP. Montana statutes assign MFWP the authority and responsibilities related to the protection of life and property in the face of imminent danger or harm from wildlife.

15 Wolf Packs or Greater -- Landowners or their agents may non-lethally harass a wolf or wolves without a permit if wolves are disrupting livestock on public or private land. The intent is to discourage wolf activity in close proximity to livestock, before a depredation actually takes place and more intensive management actions become necessary. If non-lethal harassment does not discourage wolves from chasing, testing, or otherwise disrupting livestock, the producer may contact MFWP to receive a special kill permit, valid for public and private lands, in accordance with other terms mutually agreed to by both parties. Concurrence by the administering land management agency may be required prior to lethal control activities. MFWP will be more liberal in the number of special kill permits granted as wolf numbers increase and for depredations in mixed land ownership patterns.

If a livestock producer kills a wolf under a special kill permit, he/she should not move or otherwise disturb the carcass. After securing the scene, producers should then report the incident to MFWP as soon as possible, but within 72 hours. Upon investigation, the entire carcass must be returned to MFWP. Livestock producers will be held accountable for wolves in the same manner as for other legally classified animals killed under permit.

If a depredation does occur on public or private lands, the producer should secure the scene and report the incident to WS, as they presently do for other predator-related livestock losses. Upon a field investigation, WS may consult with MFWP or initiate non-lethal or lethal control, as appropriate and according to a MOU between MFWP, MDOL, and WS.

In lieu of a federal or state response, a designated trapper or a licensed sportsperson may be authorized to lethally remove problem wolves on public or private lands when the number of packs is 15 or greater. Taking of problem wolves by the public would be subject to licensing requirements and other regulations approved by the MFWP Commission that govern the regulated hunting or trapping of wolves. A licensed landowner, livestock producer, or their agent may also kill a wolf, without a special kill permit, by adhering to the regulations for public harvest approved by the MFWP Commission.

Upon delisting, provisions of SB163 take effect. Producers (or their agents) will be able to kill a wolf (without a special kill permit) if the wolf is "attacking, killing, or threatening to kill" livestock, regardless of whether the incident takes place on public or private lands. This is consistent with the intent of allowing private citizens to take wildlife to protect persons or livestock (Montana Statute 87-3-130). If a livestock producer kills a wolf under the defense of property provisions of SB163, he/she should not move or otherwise disturb the carcass. After securing the scene, livestock producers should then report the incident to MFWP as soon as possible, but within 72 hours. Upon investigation, the entire carcass must be turned in. Montana statutes assign MFWP the authority and responsibilities related to the protection of life and property in the face of imminent danger or harm from wildlife.

Recreationists, Hunters, Outfitters etc.

Citizens in backcountry areas should rely on non-lethal harassment unless wolves directly threaten a person, pet, or livestock. If a wolf is killed in defense of life or property, citizens should protect the scene from disturbance and report it to MFWP as soon as possible, but within 72 hours. MFWP or WS will conduct a field investigation. If an incident takes place in mixed land ownerships, recreationists should also rely on non-lethal techniques. The incident should be reported to MFWP. If a wolf is killed in defense of life or property, citizens should not disturb the carcass, but protect the scene and report the incident to MFWP as soon as possible, but within 72 hours. Anytime a wolf is killed in defense of life or property, the entire carcass must be returned to MFWP.

Compensation

Montana recognizes that wolf population recovery and persistence will result in the loss of personal property or income due to wolf activity and depredation. Some producers are exposed to potential financial liabilities that did not exist prior to wolves. Many livestock producers operate on a narrow financial margin and even a single depredation event could have significant economic consequences. There are additional costs associated with

safeguarding livestock against wolf depredation, such as extra people to supervise livestock, extra guarding animals, increased travel to check livestock more frequently, and veterinary expenses if livestock are injured. Some producers report decreased pregnancy rates in cows harassed by wolves. Sometimes producers report retrieving fewer head of livestock at the end of the grazing season, but cannot find evidence of a carcass. Even with a carcass, cause of death may still be unknown. Nonetheless, what remains clear is that livestock producers must reconsider certain management practices in the presence of wolves to proactively minimize the potential for wolf-livestock conflict.

Compensation programs typically are established for problems that developed recently, were exacerbated by governmental actions, or were caused by highly valued species (Wagner et al. 1997). Wolf presence in the northern Rockies touches on all three scenarios. Defenders of Wildlife, a non-profit wildlife advocacy organization, recognized the disparity of the costs and benefits for wolf restoration between the ranching community and those advocating wolf recovery. Their goal was to shift the economic liability away from ranchers and towards wolf advocates through a compensation program that reimbursed ranchers for losses from wolf depredation (Fischer 1989). The Wolf Compensation Fund was established in 1987 and paid a total of $150,590 to ranchers in the tri-state area between 1987 and February 2001 (Defenders of Wildlife 2001). In some cases, veterinary bills for livestock injured by wolves were reimbursed. Funds from the Wolf Compensation Fund have also been used to purchase livestock feed, lease supplemental pasture, purchase additional guarding animals or fencing materials, and to cost-share other modifications to husbandry practices to proactively minimize the potential for future depredations. Compensation addresses one of the major concerns about wolf restoration and has helped to increase the tolerance for wolves. See Appendix 7 for additional data on compensation payments made by Defenders of Wildlife between 1987 and April 2001.

The State of Montana believes that compensation is critical to maintaining tolerance for wolves by livestock producers who are adversely affected by financial losses due to wolves. At this time, it is unclear whether Defenders of Wildlife will continue to offer compensation for losses when wolves transfer to state management jurisdiction. The State of Montana intends to find or create an entity to administer a compensation program if Defenders of Wildlife rescinds eligibility for Montana ranchers upon delisting. The entity or non-governmental organization would be independent of MFWP and MDOL to retain impartiality. Negotiations would take place directly with the producer. This approach is modeled after the existing arrangement with wolves under federal management. Presently, the Defenders of Wildlife compensation program representative negotiates directly and confidentially with the individual producer to determine compensation. This is independent from the USFWS management programs and decision-making about what happens to the offending animals. The USFWS supports the concept of compensation and believes that the existence of a private program has benefited wolf recovery (Bangs per. comm.)

The existing model has emerged somewhat through trial and error and the circumstances of individual wolf-livestock conflicts in the northern Rockies. It has also evolved since its inception. Wildlife damage compensation programs have great intuitive and theoretical appeal, and may be important tools in promoting wildlife conservation. Compensation programs may also have unintended consequences with long range implications. They are also costly, but there may be less costly ways of achieving the same ends.

A scientific evaluation of state government predator compensation programs in Idaho and Wyoming and of the Defenders of Wildlife programs in Montana, Idaho, and Wyoming for grizzly bears and wolves has recently gotten underway. A partnership among private citizens, non-governmental organizations, state and federal agencies, and academic institutions has formed. The objectives are to evaluate the effectiveness of these compensation programs, examine the role compensation programs play in predator conservation efforts within agricultural settings, determine how compensation programs can be structured and administered to meet the needs of livestock producers, and assess the impact that compensation programs have on public opinions and attitudes towards predator conservation and management. This effort is known as the Predator Compensation Research Study. A diversity of interests is represented on the advisory committee, including representatives of the funding organizations and livestock producers. The findings of this research effort will have important implications for the future wolf compensation program in Montana. A final report is anticipated in spring, 2003. With new information in hand, MFWP will be in a better position to work with Defenders of Wildlife or some other entity to help design a compensation program based on the cooperative input from livestock producers, non-governmental organizations, and other interested parties.

Funding

Compensation has been an important companion to federal agency wolf management activities with respect to wolf-livestock conflicts. Under state management authority, similar needs will exist. Montana would like to maintain and enhance the benefits of the compensation program. But the state is prohibited from financially compensating citizens for damages caused by wildlife. We do not foresee any changes in this regard. Instead, MFWP and MDOL offer technical assistance, consult with WS, or use other management tools to address damage caused by wildlife. Since compensation payments cannot be made from MFWP funds or matching federal monies intended for wildlife or habitat programs, securing alternative funding is crucial to program success. Nonetheless, MFWP is exploring alternative funding sources, including: a surcharge to national parks entrance fees to be earmarked for wolf conservation and management activities in the tri-state area, a livestock insurance program through USDA, a national wolf management trust fund, and private donations or non-governmental organizational support.

MFWP is also looking into the feasibility of a livestock insurance program for producers, which is modeled after the crop insurance program. Producers would pay a subsidized premium to insure livestock for losses due to wolves. Loss payments would come from premiums collected over all producers and from private donations. WS would verify losses.

Despite the present uncertainty of how a compensation program would be designed and administered, funding this element of the overall wolf management program is essential to its successful implementation. The State of Montana will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources. Securing adequate funding for compensation is of equal priority as securing funding to implement the state and federal agency management activities. A later chapter also discusses funding possibilities for a compensation program.

Procedures

Although many of the details about funding, administration, or relationship to management actions by agencies or livestock producers are still unknown at this time, WS will investigate cases of suspected wolf depredation, just as they do for other wildlife species causing damage to livestock. If WS *confirms* that a wolf was responsible, the producer would be eligible for compensation, regardless of whether the incident occurred on public or private lands. If the field investigation concludes that wolf depredation was *probable,* the producer would also be eligible for compensation. Additional research is required to examine the question of undocumented livestock losses.

Producers would be compensated for livestock losses at fair market value at the time of death and at fall value for young of the year. Eligible livestock include cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, and guarding animals. The Council recommended that losses of household domestic pets should not be compensated, but acknowledged the significant emotional loss. The Council also recommended that losses at alternative livestock (game farm) facilities should not be compensated. Wolf ingress into a poorly secured facility is the responsibility of the operator. The fact that many alternative livestock facilities confine native prey species, which may naturally attract wolf activity, further precludes payments for these losses. In the same vein, recreationists take responsibility for their pets when recreating in occupied wolf habitat.

Implementation

Table 3 summarizes a spectrum of state, federal, or private management strategies to minimize the potential for wolf-livestock conflicts and to resolve conflicts where and when they develop. Many activities fall within existing duties and responsibilities already carried out by WS or MFWP, but some activities clearly add to existing responsibilities and/or workloads. For example, WS may respond to increasing numbers of wolf-livestock complaints as wolf numbers and distribution expand. WS has been actively involved during the federal wolf recovery phase. From 1995-2000, WS spent an average of $90,086 per year for wolf-related work, including half of the yearly expenses of a Wolf Management Specialist position (L. Handegard, pers. comm.). Montana will also contract with WS for assistance with wolf depredation activities. WS will assist with wolf capture, control actions, research and development of non-lethal methods, and also technical assistance to producers. Expenditures for wolf management by WS could increase in the future as wolves increase in number and distribution. Experience in Minnesota indicates that as wolf numbers and distribution increase into agricultural areas, wolf-livestock conflict

may increase (Mech 1998b). MFWP will seek additional funding and will also support WS in their effort to obtain additional funding.

MFWP will also experience increased responsibilities and workloads associated with wolf-livestock conflicts. The MFWP Enforcement Division will now provide technical assistance to landowners and/or assist WS in resolving wolf-livestock complaints. MFWP may also experience increased workloads associated with administration of any special kill permits issued directly to livestock producers or investigations of wolves killed while attacking livestock. The MFWP Wildlife Laboratory will experience an increased workload associated with processing

Table 3. The spectrum of potential management activities to minimize the potential for wolf-livestock conflicts and the management activities to resolve conflicts where and when they develop. The adaptive management model calls for selection of different management strategies as the number of wolf packs changes from less than 15 to 15 or greater. The different management settings (Public Lands and Mixed Land Ownerships) call for different strategies, depending on landownership patterns, social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of wolf packs or management settings, as indicated by the right arrows.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ **15 Packs or Greater**	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Livestock Producers	Lethal take in defense of life/property	→	→	→
	Non-lethal harassment	→	→	→
	WS response; technical assistance from WS & MFWP	→	→	→
	No MFWP special kill permit for public lands	MFWP kill permit for private lands only; conservative number issued	Limited number of MFWP kill permits for public lands	MFWP kill permits for private or public lands; number issued more liberal
	No open season for designated trapper	→	Designated trapper or licensed hunter/trapper during open season	Designated trapper or licensed hunter/trapper during open season
Citizens (outfitters, hunters, recreationists)	Lethal take in defense of life/property	→	→	→
	Non-lethal harassment	→	→	→

Table 3. Continued.

	WOLF PACK NUMBER Less Than 15 Packs* ← | → 15 Packs or Greater			
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Wildlife Services	Technical assistance to producers, cooperation with MFW	→	→	→
	Activities directed by Memorandum of Understanding with Montana Fish, Wildlife & Parks and Montana Department of Livestock	→	→	→
	Incremental approach, conservative	→	Incremental approach	Incremental approach, more liberal
Montana Fish, Wildlife & Parks	Technical assistance to producers, cooperation with Wildlife Services	→	→	→
	No special kill permits issued	Special kill permit administration and oversight; carcass retrieval	→	→
	Responsible for disposition of wolves involved in livestock conflicts	→	→	→
	Public outreach to inform and address specific needs	→	→	→
	No open hunt/trap season	→	Conservative hunt/trap season where depredation is chronic	Hunt/trap season which maintains wolf packs and minimizes potential for wolf-livestock conflict

Table 3. Continued.
* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. Since not all packs successfully breed and have pups every year, Montana will maintain at least 14-17 packs statewide to insure achievement of a minimum number of 10 breeding pairs with at least two pups on December 31.

wolf carcasses or filling educational requests. Additional resources will be required to implement these new responsibilities. Existing budget and personnel resources cannot absorb this expansion.

Table 4 summarizes the direction and guidelines for compensation of livestock losses due to wolf depredation. There are additional responsibilities and workloads associated with providing compensation to livestock producers, although it is not clear who or how a compensation program or livestock insurance program will be administered at this time. Results from the Compensation Research Study will help identify the best, most efficient and responsive ways to fulfill this aspect of the overall wolf management program.

The Compensation Research Study will address how well livestock producers think the Defenders of Wildlife compensation program meets their needs and ways in which the program could be improved. Livestock interests on the Montana Wolf Advisory Council identified the challenges associated with the issue of *unconfirmed* livestock losses – losses for which wolf predation could not be *confirmed* definitively because of decomposed remains, scavenging by other species, or near complete consumption. Presently, these are recorded as *unconfirmed* by WS agents, with additional information about the evidence and the circumstances noted on their report forms. Defenders of Wildlife uses this additional information along with other supplemental information to make a determination of *probable* loss due to wolves, strictly for the purposes of compensation. If information indicates a strong likelihood, Defenders of Wildlife, has reimbursed producers for *probable* losses due to wolves. Federal agency management actions have still been based on the WS determination of *confirmed/unconfirmed*. Whether Defenders of Wildlife would continue to reimburse producers for *probable* losses in the future, according to their own criteria and information provided from WS, is unknown at this time. Long-term solvency of any compensation fund could be in jeopardy if fund-raising does not keep pace with the amount paid out in claims.

If Defenders of Wildlife is not the primary source for compensation in the future under state management jurisdiction, the state would need to find or create an entity to administer a compensation program and provide guidelines for payment. Implementation of the Council's recommendation to compensate for *probable* losses could be somewhat problematic. Guidelines would need to clarify the circumstances and evidence required for payment of *probable* claims in the absence of a *probable* designation by WS. Addition of the *probable* category represents a new type of loss for the Montana-based WS investigative procedures and would need to be approved by WS. It would be challenging for both investigating WS agents and administrators of a compensation program to apply a consistent set of criteria for this determination because the circumstances and available evidence vary from one incident to another. Time elapsed since death, weather, or other factors unique to that incident all affect the evidence available and its interpretation. Selection of the *probable* category has to do with the degree of certainty on the part of the WS agent, based on less than conclusive evidence to confirm or not confirm a wolf or wolves as the cause of loss. While all investigators look for the same evidence, the interpretation may be less consistent when investigators must use their own professional judgment in the absence of clear evidence. MFWP would also find the decision-making process on the disposition of the wolf or wolves more difficult if there is less certainty about the cause of death or injury, especially in light of all the other means by which livestock die or are injured. Nonetheless, MFWP will explore the concept and utilize the findings of the Compensation Research Study to help guide the compensation elements of the wolf management program.

All parties share the responsibility of addressing the economic challenges of minimizing the potential for wolf-livestock conflicts and resolving conflicts where and when they develop. A draft budget is presented as Appendix 3.

The budget outlines the personnel and financial resources necessary to proactively minimize the potential for wolf-livestock conflict and resolve conflicts where and when they develop. MFWP and WS cooperatively fulfill these responsibilities, as described in this Chapter.

Table 4. Direction and guidelines for compensation of livestock losses due to wolf depredation in Montana. The adaptive management model calls for selection of different management strategies as the number of wolf packs changes from less than 15 to 15 or greater. The different management settings (Public Lands and Mixed Land Ownerships) call for different strategies, depending on landownership patterns, social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of wolf packs or management settings, as indicated by the right arrows.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ **15 Packs or Greater**	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Livestock Producers (cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, guarding animals)	Incentives to reduce potential for conflict →	→	→	→
	Compensation and/or livestock insurance program for *confirmed* and *probable* wolf losses at fair market value →	→	→	→
	No compensation for pets, alternative livestock →	→	→	→
Funding	Private donations and/or special state or federal appropriations (no MFWP funds) →	→	→	→
Administration	Pending results of Compensation Research Study; Non-governmental organization independent of MFWP; Defenders of Wildlife uncertain; →	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. Since not all packs successfully breed and have pups every year, Montana will maintain at least 14-17 packs statewide to insure achievement of a minimum number of 10 breeding pairs with at least two pups on December 31.

The budget truly reflects the comprehensive nature of designing and implementing a wolf management program that addresses wolf-livestock conflicts. While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation . Some components of the wolf program may not be captured fully by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. This budget will be refined in the future as MFWP gains more experience. It may also be refined to reflect changes in costs associated with depredation management by WS. This

budget also estimates annual compensation payments. The estimate was derived from the 1997 payments by Defenders of Wildlife for losses within the State of Montana, extrapolated over a projected 20 packs. Actual payments in any given year may be higher or lower than the budgeted amount shown. It is important to capture what may represent the upper limit of claims paid for *confirmed* and *probable* losses in any single year. There may also be administrative costs associated with implementing a compensation program.

In summary, implementation of the management strategies and compensation program outlined in this Chapter will require enhanced or new sources of funding. Without adequate financial resources for both elements (management and compensation), implementation is not possible. All possible sources of funding including public/private foundations, federal or state appropriations, and other private sources will be sought.

WOLF – HUMAN CONFLICTS

Introduction

In recent years, MFWP has taken a proactive approach in helping people learn how to live and recreate in wildlife habitats. Other state and federal agencies have done the same. Increasing numbers of people are living within the urban-wildland interface where a potential for conflict with a wide variety of wildlife species exists. Outdoor recreation trends also place increasing numbers of people in wildlife habitats (Youmans 1999). Living and recreating in wildlife habitats has inherent risks. Through policy development, public outreach, and technical assistance to landowners and recreationists, MFWP is working towards mitigating those risks to the extent possible.

In accordance with Montana statutes, MFWP and the MFWP Commission are authorized and charged with the duties of protecting people and personal property from damage and depredation caused by wildlife. MFWP defines a public safety problem related to carnivores as: any situation where an MFWP employee reasonably determines that the continued presence poses a threat to human safety, an attack has resulted in the loss of livestock or personal pets, or that a human has been physically injured or killed.

Wolf-Human Encounters

Public safety is an important consideration because species such as the gray wolf, mountain lion, black or grizzly bear are capable of injuring or potentially killing a person. Even though wolves generally fear humans, there are instances where individual wolves lost their wariness of people (Mech 1998a, Route 1999). In Canada's Algonquin Provincial Park, four different wolves progressively lost their fear of humans, resulting in five separate incidents over the last 11 years. These four wolves, though previously non-aggressive, eventually bit humans. Two incidents of wolf aggression towards people were serious and required stitches. Each of the wolves was accustomed to humans and had been frequenting campgrounds, running off with backpacks, human food, and other camping items over a period of months. People interacted with these wolves at very close range until the wolf became too bold (Route 1999). Park managers removed the four wolves. Some wolves in Denali National Park in Alaska have grown increasingly tolerant of close proximity to humans in and around campsites, although no injuries have been reported (Boyd in press). One incident on Vargas Island, British Columbia in which a wolf bit a camper paralleled the incidents in Algonquin Provincial Park. Park managers removed two wolves that had been loitering near camping areas. One recent incident in Icy Bay near Anchorage, Alaska left a young boy with several stitches after a wolf bite. This wolf was also removed.

It appears that most wolf-human encounters were not precipitated by the wolf perceiving the human as prey because of how the wolves behaved, the presence of domestic dogs, or the sequence of events (Mech 1998a). This is in stark contrast to the case histories of mountain lion-human incidents in which it appears that mountain lions sometimes do perceive humans as prey (Deurbrouck and Miller 2001). Case studies of injurious bear-human incidents highlight surprise encounters, defense of cubs or food, and/or the bear perceiving the human as a threat to be neutralized. For wolves, a loss of fear seems to be a common thread running through all North American wolf incidents resulting in human injury (Mech 1998a). It appears that wolves can habituate to humans or human activities as readily as bears or mountain lions (Aune 1991, Boyd in press). Whether or not this degree of familiarity translates to a threat to human safety may hinge on prompt management response by the appropriate authorities. It appears that habituation in wolves may not require a consistent pattern of food conditioning as seems the case for bears. Wolves may

increase their tolerance for the close proximity of people through repeated, long-term social interaction with people and "being rewarded" in some fashion, whether food or otherwise. It seems that some period of time is required for a wolf to habituate to human proximity, although precisely how long may be a function of setting and vary from one individual wolf to another. MFWP would be as concerned about habituated wolves as we are about habituated bears and will attempt to discourage habituation for all wildlife species and carnivores in particular.

No wolf-caused human fatality has been documented in North America. All cases in which a human was injured occurred where wolves have shared the landscape with people for a long time. Most incidents occurred in park or preserve settings where wolves were legally protected, but individual wolves had become habituated. On the contrary, there are no reported incidents from areas where wolves have recently recolonized or been reintroduced in the northern Rockies or the upper Midwest. In contrast, mountain lions are responsible for ten human deaths and 48 nonfatal injuries in the U.S. and Canada from 1890-1990 (Beier 1991).

In Montana, hikers have unknowingly encountered an occupied den site and wolves barked. Other encounters occurred away from wolf den sites and ended when the wolf retreated, without injury to human or pet. One incident involved a hiker with two dogs and multiple wolves. Since the mid-1980's, the only two injuries to humans by wolves in Montana occurred when wolf researchers and managers handled unrestrained animals during live-capture operations. However, there have been 8 mountain lion-human incidents in Montana from 1990-1999 in which seven people were injured and a young boy was killed (MFWP unpubl. data). These were all encounters in which the human was not aware of the lion.

In Montana, wolves have injured and killed domestic pets, primarily dogs. Most incidents involved herding dogs associated with livestock operations. Other cases of dog depredations were hounds trailing mountain lion or bobcat scent. Hounds typically do not switch scent trails from felids to canids, but may encounter wolves while pursuing wild cats or at lion kills assumed by wolves. More hound dogs have been lost to mountain lions than wolves thus far in Montana. Claar et al. (1999) summarized current understanding and knowledge of hound dog-wolf interactions. Bangs and Shivik (2001) also noted wolves probably perceived hunting hounds and guarding/herding dogs as "trespassing" competitors rather than as prey because wolves did not feed on the domestic dogs.

Despite their wariness of people, wolves will still use natural habitats in close proximity to humans. This is particularly true in northwestern Montana where people build their homes in thick, forested habitats. Members of the Murphy Lake pack are occasionally seen within 100 yards of homes and in rare instances closer. While this pack is clearly accustomed to human activity within its home range, its members have shared the landscape with people without incident for 10 years. One pack just outside of YNP is often seen in open grassland terrain.

Because wolves live in social groups, people may see them more frequently than other large carnivores, although wolves are not necessarily any more dangerous. Mountain lions and bears are solitary, except for mothers with dependent young or during the breeding season. Wolves are much less secretive than mountain lions. Wolves feed and rest in open areas with good visibility, whereas lions tend to hide their kills and feed or rest in dense vegetative cover. Wolves will also travel across openings in forest cover or natural meadows in ways that mountain lions or bears do not. In addition, wolves use linear corridors such as roads, utility lines or railroad rights-of-way for traveling and scent marking. Because of the differences between the secretive stalking behavior of mountain lions and the broad, open searching behavior of wolves, people probably have a greater chance of a close encounter with a mountain lion than a wolf.

Another important consideration also stems from the fact that the natural order of existence for wolves in the wild is to belong to a pack. Pack membership has attendant functions such as establishment and maintenance of social hierarchies, patrolling and marking territory boundaries, pup-tending, hunting, bringing food back to pups, resting, or interacting with other wolves or other wildlife species. Wolves affiliated with a pack are usually actively engaged in one of these "purposes" and do not spend extended periods of time loitering in any one location – activity at den or rendezvous sites notwithstanding. Pack-affiliated wolves, when seen alone, will usually be seen sporadically because they are en route to someplace else for some particular reason. Even dispersing wolves will generally not loiter and will move through an area near people. This is in contrast to a situation in which a single wolf is seen repeatedly loitering in an area near people and does not appear to be affiliated with a pack. These individual wolves could gradually loose their fear of people, become food conditioned, or otherwise interact with people at

decreasingly safe distances. If this pattern is allowed to continue through time, the wolf may become a safety concern. This will become especially evident if the animal does not respond to hazing or harassment.

Management

MFWP intends to reduce the potential for wolf-human conflicts and minimize the risks of human injury due to wolf presence in the state. MFWP's approach to wolf-human interactions will model the policies for addressing mountain lion-human or bear-human conflicts. First and foremost is to discourage habituation and then respond to conflicts where and when they develop. MFWP, through its educational efforts and enforcement of existing statutes, discourages the public from artificially feeding wildlife or allowing wild animals access to human foods, garbage, pet food, livestock feed, or birdseed. Any artificial concentration of wild animals caused by supplemental feeding (e.g. deer or turkeys) may constitute a threat to public safety if carnivores are attracted to the supplemental food itself or the animals using the supplemental food. In addition, MFWP reminds people to keep a safe distance and that wild animals should be kept wild. While MFWP emphasizes the educational approach in working with the public to prevent wildlife habituation and maintain human safety, Montana statutes prohibit citizens from "purposely" providing supplemental feed in a manner that results in an artificial concentration of game animals that may potentially contribute to the transmission of disease or that constitutes a threat to public safety (MCA 87-3-130).

MFWP developed specific guidelines for addressing situations in which mountain lions or black or grizzly bears are a nuisance or threaten public safety. Management actions are carried out by various MFWP personnel, including biologists, game wardens, and conflict management specialists. Similar guidelines will be developed for wolves. If a wolf loiters near ranch buildings or rural residences, the potential threat to human safety will be evaluated, taking into account the setting, behavior of the animal, and the sequence of events. MFWP will require some degree of flexibility to be most responsive to public safety concerns. A wolf will be permitted to move through these areas, but length of stay and behavior will be important criteria for determining the appropriate management response. Less deference will be granted to a single loitering wolf found to have ongoing exposure to and association near people. Across the spectrum of wolf distribution and numbers, MFWP will take an incremental approach so that the management response matches the infraction. Potential actions include: increase local public outreach and education, closely monitoring the situation, marking the animal with a radio collar to track its movements, aversive or disruptive conditioning, harassment, relocation, or lethal removal. If relocation is selected, remote public lands would be preferred release sites. MFWP will also cooperate with other agencies and landowners in researching new techniques to resolve wolf-human conflicts. Suspicious, large-sized canids in these situations could be released captive wolves or wolf-dog hybrids. Large canids that appear wolf-like and demonstrate habituated behavior potentially threatening human safety will be lethally removed.

Montana citizens have the right to protect or defend themselves if threatened by wildlife. Mountain lions, black bears, and grizzly bears have all been legally killed for this reason. In the unlikely need for defense of human life during a wolf encounter, citizens may use any means, including lethal force, to address an imminent threat, regardless of wolf population status or whether the incident takes place on public or private land. Guarding and domestic dogs can also be defended using lethal means. Any wolves killed under these circumstances must be reported to MFWP as soon as possible, but within 72 hours. Citizens must also turn in the entire carcass. In the absence of a direct threat to life or property, citizens are encouraged to rely on non-lethal harassment to discourage wolf presence near their homes or person when recreating outdoors.

As wolf numbers and distribution increase in Montana, the public's concern about human safety could increase. Humans and wolves may encounter one another at close range in a variety of settings. MFWP will provide information to the general public about appropriate responses during wolf encounters (do's and don'ts) and how to minimize the potential for problems near homes and rural schools. This material will also include information about wolf behavior, body posture, tail position, vocalizations, etc. to help the public evaluate the situation, correctly interpret wolf behavior, and communicate the details accurately to agency personnel. An educational effort will also help the public understand the differences between wolves, mountain lions, and bears in terms of animal behaviors, appropriate human responses when threatened, and how to live and recreate outdoors in the presence of these large carnivores. See Appendix 8, Draft Public Information Plan for additional information on the public outreach efforts.

Although the primary management responsibility related to wildlife and human safety rests with MFWP, local law enforcement or other state of federal agency personnel may respond to a wolf-human incident if MFWP personnel are not available in a timely manner. This cooperation already takes place for other wildlife species. Regardless of the responding party, the public can be confident that response will be rapid and the conflict will be resolved in favor of public safety. Providing the public an effective and prompt response to wolf-human conflicts, whether through their own or agency management actions, will foster public support for wolves in Montana.

Implementation

Table 5 summarizes a spectrum of management activities to ensure public safety. While MFWP has always been charged with this responsibility, wolves represent a new category of wildlife for which the state assumes responsibility, upon delisting. Game wardens, conflict specialists, and some wildlife biologists will now respond to wolf-human incidents and any threats to public safety. Information specialists will now incorporate new materials into their public outreach efforts. Wolves have engaged the spirit, imagination, and emotions of people for a long time – whether fear or awe. Public outreach materials must address the public's perception of risk and fear of injury or death due to wolves and how to protect oneself during a close encounter. Public outreach materials must also guide the public towards maintaining a healthy respect for wildlife and keeping it wild, an ethical approach to viewing wolves, and the hazards of habituation. Table 5 also summarizes actions that citizens may take during a threatening encounter with wolves.

Many activities fall within existing duties and responsibilities already carried out by MFWP, but some activities clearly add to existing responsibilities and workloads. Additional resources will be required to implement these new responsibilities because existing budget and personnel resources cannot absorb the expansion. A draft budget is presented as Appendix 3. The budget outlines the personnel and financial resources necessary to prevent wolf-human conflicts and minimize the risks of human injury due to wolf presence. Public safety is a responsibility that MFWP takes very seriously and it is an agency function that crosses many Divisions. The Conservation Education Division, the Wildlife Division, and the Enforcement Division all have a role to play, as is outlined in this Chapter. As such, the budget truly reflects the comprehensive nature of designing and implementing a wolf management program that also assures human safety. While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation. Some components of the wolf program may not be captured fully by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. This budget will be refined in the future as MFWP gains more experience. MFWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources. Adequate funding will be necessary to fully implement the provisions to assure human safety outlined in this Chapter.

INFORMATION AND EDUCATION PROGRAM

The primary determinant of the long-term status of gray wolf populations will be human attitudes towards wolves (USFWS 2000). But attitudes, beliefs, and concerns about wolves are highly variable. Underlying various attitudes are human safety concerns, perceptions of risk, the symbolic significance of wolves, economic impacts on livestock producers, convictions that wolves should not be killed, Native American traditions, perceptions that wolves compete with human hunters for ungulates, beliefs that wolves do not have a place in the 21st century – and many others. Attitudes have changed over time and acceptance for wolves has increased among some segments of the public. Attitudes will continue to evolve.

Regardless of personal beliefs and attitudes, an active, informed public is critical to the protection of Montana's wildlife resources. This is particularly true for the gray wolf. The history of wolves in Montana has as much to do with the relationship between wolves and people as it does with the ecology of the species. The same will be true of the wolf's future.

Table 5. Spectrum of management and public outreach activities to ensure public safety in Montana. The adaptive management model calls for selection of different management strategies as the number of wolf packs changes from less than 15 to 15 or greater. The different management settings (Public Lands and Mixed Land Ownerships) call for different strategies, depending on landownership patterns, social factors, land use patterns, biological constraints, and the physical attributes of the environment. Some management strategies may apply across all numbers of wolf packs or management settings, as indicated by the right arrows.

	WOLF PACK NUMBER			
	Less Than 15 Packs* ←		→ **15 Packs or Greater**	
	Public Lands *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*	**Public Lands** *(backcountry areas & near National Parks)*	**Mixed Land Ownerships** *(interspersed public and private lands; interspersed agriculture)*
Citizens	Non –lethal harassment →	→	→	→
	Lethal take in defense of life/property →	→	→	→
Agency personnel	MFWP Guidelines for Nuisance Wolves →	→	→	→
or	Non-lethal harassment →	→	→	→
Local Law Enforcement	Lethal removal if threat to public safety →	→	→	→
Montana Fish, Wildlife & Parks	Public outreach to inform & address specific needs →	→	→	→
	Discourage wolf habituation →	→	→	→

* Montana shares a legal requirement with the states of Idaho and Wyoming to maintain a minimum total of 30 breeding pairs in the region. Since not all packs successfully breed and have pups every year, Montana will maintain at least 14-17 packs statewide to insure achievement of a minimum number of 10 breeding pairs with at least two pups on December 31.

A wolf management plan for any state will be controversial. Personal opinions, anecdotal experiences, and personal biases lead to emotional and sometimes irrational viewpoints, creating a challenging environment in which to manage the species. MFWP recognizes the importance, value, and need for an educational program to parallel wolf management activities. The objective is to provide scientifically based, factual information regarding the gray wolf and its management in Montana, in hopes that the public will become more knowledgeable, more objective, and less emotional about this species and its management. Strong outreach programs may also help decrease the level of illegal mortality.

MFWP will acquire any and all information utilized in the education program from all available sources, including other state and federal agencies and non-governmental sources. MFWP will take a leadership role in formulating and disseminating educational materials. However, the information sources will be wide-ranging and include other state and federal agencies, non-governmental organizations with a variety of interests, and Native American tribes. All material provided to MFWP and included in the program must be factual and have a foundation of scientific scrutiny. MFWP will be ultimately responsible for content. A collaborative approach will also be necessary to

ensure that different groups do not put out conflicting information that could erode public understanding and acceptance of the wolf management program.

The audience of the education program will include (but not be limited to) the general public, students, visitors to the state, sportspersons and outdoor recreationists, the agricultural community, and agency personnel. While the specific emphasis may differ by audience, it is important to convey some basic information to everyone, such as wolf numbers and distribution in Montana, identification and ecology of the species, and guidelines for ethical viewing. The values and challenges of wolf conservation and management will also be conveyed. Delivery of educational information will also target specific audiences. For example, hunting and trapping regulations may emphasize wolf vs. coyote identification more strongly than educational materials intended for elementary school students.

The MFWP Conservation Education Division has the primary responsibility to develop a public outreach/educational plan for Montana (Appendix 8). Informally, personnel from all MFWP Divisions will disseminate information to the public on a routine basis, much as they already do for all fish and wildlife species in Montana. However, the tremendous need for public outreach on such a controversial species requires that MFWP create partnerships with the private sector to help us meet those needs.

It will be important to identify the most efficient ways to reach various audiences, which means gaining an improved understanding of where they get their information. For example, in the mid 1980's, rural residents along the west boundary of GNP and the general hunting population of Flathead County got their information about wolves from different sources (Tucker and Pletscher 1989). Dispersed rural residents relied on people (neighbors or biologists) more than on printed media. In contrast, the hunting population used newspapers, books, and magazines as their primary information sources. Furthermore, the hunter sample did not regularly attend public meetings and already had strong opinions about wolves. For mountain lions, a combination of mass media and agency communications is required for developing general public knowledge and acceptance (Riley and Decker 2000). Given the broad spectrum of interests with a stake in wolf conservation and management, the education program will utilize a broad spectrum of methods and outlets to adequately fulfill this fundamental component of Montana's wolf plan.

Implementation

Appendix 8 describes the Public Information Plan. Some of the activities fall within existing duties and responsibilities already carried out by MFWP but some activities clearly add to existing responsibilities and workloads. Additional resources will be required to implement these new responsibilities. A draft budget is presented as Appendix 3. The budget outlines the personnel and financial resources necessary to fulfill the public outreach and educational needs outlined in this Chapter. Getting information out to the public is an important function that is inherent in many of the management activities described in this plan. The budget truly reflects the comprehensive nature of designing and implementing a wolf conservation and management program. While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation. Some components of the wolf program may not be captured fully by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. This budget will be refined in the future as MFWP gains more experience with wolf management. MFWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources. Adequate funding will be necessary to fully implement the wolf conservation and management provisions of this Chapter.

PLAN MONITORING AND EVALUATION

Upon delisting and with adequate funding secured, MFWP will implement the Wolf Conservation and Management Plan. This plan will guide MFWP managers and others responsible for the planning and policy decisions that affect wolf management in Montana. It will also guide decision-making at the field level. MFWP personnel will use this plan to prioritize field activities, manage time/budgets, formulate wolf management recommendations, and coordinate with personnel of other state and federal agencies. Personnel of other state or federal agencies will also use this plan as a source of information and guidance.

During the first five years after delisting, MFWP will be required to document that the wolf population in Montana is secure and exceeds the relisting criteria identified when wolves are delisted. MFWP will consult with USFWS on a regular basis, including a periodic formal review by the USFWS. USFWS will point out any deficiencies or areas of concern and recommend corrective actions to MFWP. The State of Montana recognizes that the interests of its citizens are best served by maintaining a secure, viable population that is managed by MFWP and its cooperating partners and not the federal government. We would take the necessary corrective measures to avoid a relisting of the gray wolf under ESA.

During the first five years, MFWP will also confer with other state and federal agencies in Montana. Ongoing consultation will evaluate aspects of the management program as they intersect with the responsibilities and jurisdictions of the other agencies. Conferring with cooperating partners such as WS will also help identify any necessary modifications stemming from unanticipated or unforeseen events. MFWP will also confer with the states of Idaho and Wyoming. These consultations will assess the collective adequacy of the three state plans to maintain a viable wolf population in the northern Rockies. These elements are discussed in more detail in the Interagency, Interstate, and Tribal Coordination section of the Wolf Conservation and Management Chapter.

The Wolf Conservation and Management Plan will also serve as a source of information and provide guidance to the MFWP Commission. However, the plan does not preempt MFWP Commission authority to formulate annual rules, set hunting and trapping season regulations, or implement emergency actions in response to unexpected events or circumstances. Whereas the MFWP Commission cannot modify the plan per se, it does have statutory authority to evaluate and modify how certain elements are implemented.

As with any wildlife management program, MFWP anticipates that the wolf program will evolve through time. MFWP will undertake a thorough, formal review of the wolf management program following the five-year USFWS oversight period required by ESA. Cooperating state and federal agencies will also participate. Findings of the review will be incorporated. The wolf management program will be subsequently reviewed at least every five years and modified to insure that the document will be as current as is practical and that the management activities originating from it are effective and appropriate.

This plan describes an adaptive management model for wolves in Montana. MFWP views the adaptive management approach as an important underpinning of the monitoring and evaluation of the Wolf Conservation and Management Plan. By definition, an adaptive model incorporates monitoring and evaluation components as an ongoing effort within the management program. Management is thus refined and improved through time as information and experience accumulate. MFWP will evaluate new information annually and incorporate it into wolf management.

An adaptive model will help address and evaluate the wolf-specific components of this plan. For example, are viable populations of wolves being maintained? Are the monitoring protocols adequate to assess wolf population trends or other biological parameters of interest? Adaptive management principles already incorporated into ungulate management programs serve the same purpose. For example, are adequate populations of prey species being maintained to sustain a wolf population and provide citizens with the opportunity to hunt a wide variety of species under a wide variety of circumstances in a sustainable manner? The advantage of managing adaptively is that, by definition, it provides a framework and a process for decision-making, as well as the mechanism to monitor and evaluate the outcomes.

Equally important components of any wolf management program are the social factors that shape public tolerance for wolves and their satisfaction with how conflicts are resolved. For example, is the management program adequately and efficiently addressing wolf-livestock conflicts? Is public safety assured? These are important management program components for which ongoing evaluation is critical. MFWP anticipates that Montana citizens will readily identify real or perceived problems or shortcomings of the wolf management program – on these topics and others.

The challenge for MFWP will be to discern between earnest differences of opinion in preferred management direction and substantive shortcomings of the program. Wolf management in Montana will take place within a complex biological, social, economic, and political environment. Difficult decisions will have to be made and will sometimes be called into question by various interests. However, the ensuing public dialogue will also help evaluate the management program and may lead to revisions. The Wolf Management Advisory Council recommended that

the State of Montana continue to engage a diverse advisory citizen's group to collaborate on the management of wolves. The Department, after reviewing input from the public, wildlife professionals, coordinating states, other state and federal agencies, etc., will modify and adapt the wolf management program in the future to maintain a viable wolf population within a complex environment.

FUNDING

Throughout its 100-year history, MFWP has actively restored, perpetuated, and managed the fish and wildlife resources of the state. Fees generated through the sale of hunting and fishing licenses and matching federal monies have funded these activities. As MFWP moves towards assuming the management responsibility for the gray wolf, we acknowledge our commitment to use MFWP and matching federal funds to conserve and manage this native species on equal standing with other carnivore species such as mountain lions and black bears. We also acknowledge that existing financial resources are not adequate to fully implement all aspects of this plan. Additional funding will be required to implement the wolf management element (and related activities) and the compensation program element. While the monies and administrative procedures for these parallel elements may or may not originate from the same source, adequate funds for each element are necessary to implement the plan. We will seek additional funding from a diversity of sources, including special state or federal appropriations, private foundations, or other private sources.

A program being pursued by the Governors of Montana, Idaho, and Wyoming is called the Northern Rocky Mountain Grizzly Bear and Gray Wolf National Management Trust. The purpose of the Trust is to generate sustainable funding for the long-term conservation of grizzly bear and gray wolf populations in the northern Rockies. The National Fish and Wildlife Foundation, a charitable non-profit corporation dedicated to the conservation of fish, wildlife, and plants and the habitats on which they depend, would financially administer the Trust. An endowment would be established, the annual interest earnings of which would fund actions necessary for species recovery or the implementation of state conservation and management plans.

More specifically, the Trust would identify, support, and fund initiatives which address grizzly and gray wolf management, monitoring, and other conservation needs, including habitat protection, species protection, scientific research, conflict resolution, compensation for damage, and education and outreach activities. The establishment of the Trust will be made with the understanding that state agencies will continue to seek necessary state appropriations and spending authority for the management and recovery of the species, consistent with their statutory mandates. The Trust will build coalitions among local, state, regional, federal, and international entities to leverage support and guide policies for grizzly bear and gray wolf conservation.

When the Trust prospectus is finalized, it will be forwarded to the respective Congressional delegations of the three states for their consideration. It is hoped that the tri-state Congressional delegation will recognize the need for secure, long term funding to address the unique challenges associated with the conservation and management of these species of significant national interest. The timing of any special federal appropriation to establish the Trust is uncertain, given other national priorities before Congress. However, the Governors hope that the fund could be developed and appropriated by the year 2003, with an initial balance of at least $40 million.

Another potential source of long-term funding for the Montana wolf conservation and management program is the Conservation and Reinvestment Act (CARA), a piece of conservation legislation introduced in February 2001 before the 107th Congress. CARA directs appropriations from the income generated by federal offshore oil and natural gas leases to state, federal and local conservation programs. Examples include fish and wildlife restoration, parks and outdoor recreation, coastal conservation, and historic preservation. The underlying premise is that revenues derived from the exploitation of the nation's non-renewable oil and gas resources should be reinvested in the protection and restoration of renewable natural resources such as fish and wildlife, public lands, and coastlines. Title III would provide annual appropriations to the states specifically for fish and wildlife programs, outdoor recreation, and conservation education. These funds are intended to fulfill a need for funding of less traditional management programs for species that are typically not hunted or fished. MFWP could use these funds for the wolf management element (and related activities), but not for the compensation program element. Those funds would still need to be secured elsewhere. CARA has garnered broad bi-partisan support. The National Governors' Association and the

Western Governors' Association have both publicly endorsed the concepts of CARA. However, the timing of any Congressional action on this legislation is also uncertain give other national priorities.

The National Management Trust and CARA have the greatest potential to provide the necessary supplemental funding. Both are stable, long-term sources of funding and engage the national interests that desire to see wild, free-roaming wolves in the northern Rockies. While MFWP also recognizes the value of having free-roaming wolves in the northern Rockies, we also seeking financial assistance to conserve and manage the species within a complex biological, social, economic, and political environment. Finding the balance without adequate funding will be very difficult.

A draft budget is presented as Appendix 3. The budget outlines the personnel and financial resources necessary to fulfill the responsibilities of wildlife conservation and management, law enforcement, assurance of human safety, public outreach, resolution of wolf-livestock conflicts, compensation, and program administration. The budget truly reflects the comprehensive nature of designing and implementing a wolf conservation and management program and its related elements such as compensation.

While this budget represents our best projection of the resources required, we cannot assess its accuracy until MFWP actually assumes management authority and begins implementation. Some components of the wolf program may not be captured fully by this draft budget. There may also be costs that could not be predicted at this time or were unforeseen. We also anticipate that the actual costs of implementation will vary from year to year. Some components of the program will come in under budget in some years, but in other years these same components may be in over budget. This budget will be refined in the future as MFWP gains more experience with wolf management. MFWP will pursue all possible funding sources including, but not limited to public/private foundations, federal or state appropriations, and other private sources.

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GLOSSARY OF TERMS AND ABBREVIATIONS

adaptive management: a model for wolf conservation and management in which the number of wolf packs determines the appropriate management strategies; changes in the number of packs determined through a monitoring program directs selection of more conservative or liberal management strategies; model incorporates resource objectives, monitoring protocols, evaluation of predicted outcomes, and a decision process

aggression: dominance behavior typical of canid species demonstrated towards humans

BLM: U.S. Bureau of Land Management

CITES: Convention on International Trade in Endangered Species

compensation: monetary payment to offset or replace the economic loss for a death or injury to livestock or guarding animals due to wolf activity; may also entail financial assistance to livestock producers to offset costs associated with modification to husbandry practices to minimize the potential for wolf-livestock conflicts

confirmed depredation: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; depredation is *confirmed* in cases where there is reasonable physical evidence that an animal was actually attacked and/or killed by a wolf. The primary confirmation would ordinarily be the presence of bite marks and associated subcutaneous hemorrhaging and tissue damage, indicating that the attack occurred while the victim was alive, as opposed to simply feeding on an already dead animal. Spacing between canine tooth punctures, feeding pattern on the carcass, fresh tracks, scat, hairs rubbed off on fences or brush, and/or eye witness accounts of the attack may help identify the specific species or individual responsible for the depredation. Predation might also be confirmed in the absence of bite marks and associated hemorrhaging (i.e. if much of the carcass has already been consumed by the predator or scavengers) **if** there is other physical evidence to confirm predation on the live animal. This might include blood spilled or sprayed at a nearby attack site or other evidence of an attack or struggle. There may also be nearby remains of other victims for which there is still sufficient evidence to confirm predation, allowing reasonable inference of confirmed predation on the animal that has been largely consumed

Council: Montana Wolf Management Advisory Council

defense of life/property: release from criminal liability for killing or injuring a wolf if the wolf is attacking, killing, or threatening to kill a person, livestock, or a domestic dog (MCA 87-3-130)

delisting: removal of the gray wolf from the list of "threatened or endangered" species that are managed by the U.S. Fish and Wildlife Service under the Endangered Species Act; delisting requires evaluation of current status of species compared to the delisting criteria with regard to habitat, over utilization, disease/predation, existing regulatory mechanisms, and other factors affecting the continued existence of the species; if the current status is secure in each of the 5 categories and the recovery criteria are met, a species is delisted and managed by the state or tribal fish and wildlife management authority

depredation: incident where livestock or guarding animals are injured or killed

ESA: Endangered Species Act

GNP: Glacier National Park

GYA: Greater Yellowstone Area

habituation: readily visible in close proximity to people or structures on a regular basis; not threatened by close proximity and may even be attracted to human presence or human food sources; extremely rare behavior in wild wolves, but typical behavior for released captive wolf or wolf-dog hybrid; for wolves, may or may not involve food conditioning

illegal mortality: wolf mortality outside the provisions of a special kill permit, defense of life or property, agency management actions, a MFWP Commission approved season, or outside other regulations established for the gray wolf as a legally classified "species in need of management"

guarding animals: domestic animals (dogs, llamas etc.) that escort livestock to decrease likelihood of a depredation incident by aggressively defending livestock in the presence of wolves or other predators

legal mortality: lethal control or mortality of a wolf within the provisions of a special kill permit, defense of life or property, agency management actions, a MFWP Commission-approved season, or the regulations established for the gray wolf as a legally classified "species in need of management"

lethal control: management actions that result in the death of a wolf

livestock: cattle, calves, hogs, pigs, horses, mules, sheep, lambs, goats, and guarding animals

management setting: the combination of landownership patterns, land use, social factors, biological constraints, and physical attributes of the environment that describe a particular area or management situation

management: the collection and application of biological information for the purposes of increasing the number of individuals within species and populations of wildlife, up to the optimum carrying capacity of their habitat, and maintaining such levels. The term includes the entire range of activities that constitute a modern scientific resource program including but not limited to research, census, law enforcement, habitat improvement, and education. Also included within the term, when and where appropriate, is the periodic or total protection of species or populations as well as regulated taking (MCA 87-5-102)

MDOL: Montana Department of Livestock

MFWP: Montana Fish, Wildlife & Parks

mixed landownership: patterns of land ownership where privately owned lands are intermingled with public lands and/or corporate-owned lands; sometimes called a "checkerboard pattern"

NPS: U.S. National Park Service

non-lethal control: a variety of management activities intended to avert or resolve a conflict situation without killing the wolf or wolves in question; examples include non lethal harassment to disrupt or interrupt wolf behaviors, frightening a wolf, monitoring of wolf location using radio telemetry, or relocation

non-lethal harassment: an example of non-lethal control where a wolf is frightened or threatened, but is not mortally wounded or killed; purpose is to discourage wolf activity
near people or livestock; examples yelling, radio-activated noise-makers, or firearms which discharge cracker shells

NPS: National Park Service

probable depredation: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; having some evidence to suggest possible predation, but lacking sufficient evidence to **clearly** confirm predation by a particular species, a kill may be classified as *probable* depending on a number of other factors such as (1) has there been any recently confirmed predation by the suspected depredating species in the same or nearby area? (2) How recently had the livestock owner or his employees observed the livestock? (3) Is there evidence (telemetry monitoring data, sightings, howling, fresh tracks etc.) to suggest that the suspected depredating species may have been in the area when the depredation occurred? All of these factors, and possibly others, should be considered in the investigator's best professional judgment.

problem wolf: wolf that has attacked livestock, or is a nuisance animal that could potentially compromise human safety

public safety problem or threat: any situation where the continued presence of a carnivore poses a threat to human safety; or, an attack has resulted in the loss of livestock or personal pets; or a human has been physically injured or killed

regulated public harvest: category of legal of wolf mortality where wolves are killed under MFWP Commission-approved seasons and regulations by licensed hunters or trappers; total harvest strictly controlled through permit or quota system; law enforcement as for other managed species

recovery goal: a total of 30 breeding pairs with equitable distribution throughout Montana, Idaho, and Wyoming for three successive years; breeding pair is defined as at least two adult wolves with at least two pups that survive to December; when the *recovery goal* is met, the U.S. Fish and Wildlife Service could initiate the process to remove the gray wolf from the list of threatened and endangered species protected by the Endangered Species Act

relisting: placing the a species back on the federal list of threatened or endangered species protected by the Endangered Species Act; relisting criteria may or may not be similar to delisting criteria; relisting requires evaluation of current status of species compared to criteria with regard to habitat, over utilization, disease/predation, existing regulatory mechanisms, and other factors affecting the continued existence of the species; if current status is not secure with regard to the 5 areas, a species may be relisted.

remove: to place in captivity or to kill under controlled conditions or in a controlled setting determined by management authorities

SB163: Senate Bill 163, Reclassify Certain Species for Management Purposes, passed during the 2001 session of the Montana Legislature and signed into law by Governor Martz

special kill permit: written authorization granted to a property owner by Montana Fish, Wildlife & Parks to kill or destroy a specified number of animals causing damage to private property; permits are only valid under a specific set of conditions or criteria

species in need of management: legal classification of nongame species that are designated by Montana Fish, Wildlife & Parks as needing special management regulations; Montana Fish, Wildlife & Parks, by regulation, establishes the limitations relating to taking, possession, transportation, exportation, processing, sale or offer for sale, or shipment considered necessary to manage nongame wildlife; Except as provided in regulations issued by the Department, it is unlawful for any person to take, possess, transport, export, sell, or offer for sale species designated by Montana Fish, Wildlife & Parks as "in need of management" (MCA 87-5-104 to 87-5-106)

take: to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill wildlife

tri-state area: states of Montana, Idaho, and Wyoming, making up the northern Rockies wolf recovery area

unconfirmed: incident where Wildlife Services conducts a field investigation of dead or injured livestock, at the request of the producer; lacking sufficient evidence to classify an incident as depredation in contrast to other possible causes of death, it is classified as *unconfirmed*; it is unclear what the cause of death may have been. The investigator may or may not have much of a carcass remaining for inspection, or the carcass may have deteriorated so as to be of no use; in the context of wolf management, cause of death is attributed to a cause other than wolf predation

undocumented loss: livestock losses for which there is no apparent explanation for the loss; usually in the context of a numerical discrepancy between the number of livestock head at the beginning of the grazing season and what is retrieved at the end of the grazing season; evidence documenting a death is usually not found

USFS: U.S. Forest Service

USFWS: U.S. Fish and Wildlife Service

WMA: Montana Fish, Wildlife & Parks Wildlife Management Area

wolf-human conflict: where a public safety problem develops; a situation where an MFWP employee reasonably determines that the continued presence poses a threat to human safety, an attack has resulted in the loss of livestock or personal pets, or that a human has been physically injured or killed.

wolf-livestock conflict: where a wolf or wolves are loitering, testing, worrying, or otherwise disrupting livestock; also, a situation where a wolf is suspected to have killed or injured livestock or guarding animals

worrying: to disrupt, cause anxiety, make uneasy, or harass repeatedly or over a period of time; also, to seize, especially by the throat, with the teeth and shake or mangle

WS: U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services; federal work unit with responsibility to address and resolve damage caused by wildlife; examples include bird concentrations at airports or depredation on livestock

YNP: Yellowstone National Park

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APPENDIX 1

MONTANA WOLF MANAGEMENT ADVISORY COUNCIL

Report to the Governor

December 5, 2000

Preamble

The State of Montana is committed to recovering wolves. We will ensure that wolf populations are maintained at high enough numbers to prevent their reclassification as "threatened" under federal law in the three-state area of Montana, Idaho, and Wyoming. The State intends to implement positive management programs to make sure that recovery is complete and wolves are integrated as a valuable part of our wildlife heritage. Montana Fish, Wildlife & Parks is already engaged in activities which promote wolf recovery through its efforts on ungulate population monitoring, research, and management, through the acquisition and designation of Wildlife Management Areas, purchase of conservation easements, and other efforts to preserve and restore wildlife habitats.

Currently, the wolf is listed under the federal Endangered Species Act of 1973 and under Montana's own Nongame and Endangered Species Conservation Act passed in 1973. Beginning in the mid-1980's, wolves have become established in Montana, Idaho, and Wyoming through natural recolonization and reintroduction. The U.S. Fish and Wildlife Service (USFWS) anticipates that recovery goals will be met in the foreseeable future. Among the requirements for delisting, the USFWS has determined that the states of Montana, Idaho, and Wyoming must have management plans and other adequate regulatory mechanisms in place to ensure that the recovered wolf population will remain secure within the northern Rocky Mountain Recovery Area following delisting.

The Governors of Montana, Idaho and Wyoming have agreed that regional coordination in wolf management among the states, tribes, and other jurisdictions will be necessary. Furthermore, it is in the best interest of the citizens of their respective states for wolf recovery and delisting to proceed as soon as possible.

The people of Montana have a significant stake in the future management of wolves and should be provided an opportunity to deliberate issues related to wolf recovery and management. The Montana Wolf Management Advisory Council was appointed by Governor Racicot to advise Montana Fish, Wildlife & Parks regarding wolf management in Montana after this species is removed from the lists of federal- and state-protected species, respectively.

We, the Council, recognize wolves as a species native to Montana. Integrating and sustaining wolf populations in suitable habitats will occur within the complex biological, social, economic, and political landscape of Montana. The State of Montana must ensure human safety, safeguard Montana's livestock industry, maintain viable wildlife populations, and uphold the support of people with diverse public interests.

Wolves do well where prey, primarily deer and elk, are abundant. Restoration and maintenance of these prey populations is made possible through the financial investments of those participating in regulated public harvest of deer, elk, and other species. Prey populations are also dependent on open space, which in Montana, is often synonymous with large agricultural operations on private lands. Livestock operations often provide winter or year-round habitat for prey, which in turn may attract wolves and create the potential for wolf-livestock conflicts. It is important to maintain the economic viability of livestock operations that are adversely affected by wolf depredation. In the long run, this ensures habitat availability for both ungulates and wolves. Continued support and investments by those participating in regulated harvest of ungulates will, in time, lead to a regulated harvest of wolves to maintain a balance with prey populations as wolf numbers and distribution increase.

All Montanans share the challenges and opportunities associated with integrating the wolf into our landscape. To honor these diverse perspectives and interests, we, the Council, endorse the following Guiding Principles as the foundation for Montana's Wolf Management Plan.

Guiding Principles

On Behalf of the Public Interest,

- The State of Montana is committed to maintaining wolf populations at numbers high enough to prevent their reclassification as "threatened" or "endangered" under federal law, in the three-state area.

- The State of Montana should contribute a proportionate number of wolf packs towards the recovery goal identified by the USFWS for the states of Montana, Idaho, and Wyoming. We believe that an equitable distribution of packs among the tri-state area is consistent with the biological intent of the Rocky Mountain Recovery Plan, will ensure a well-distributed and viable population in the region, and will foster greater public acceptance for wolf presence in Montana.

- Montana's wolf management program should be proactive, responsive, cost effective and incorporate public outreach to enhance general acceptance. Effective interagency, interstate, and state/tribal coordination will also be required.

- The Council recognizes the ecological and cultural significance of wolves to Native Americans and encourages their cooperation in coordinated management.

- The State of Montana should continue to engage a diverse, advisory citizen group to collaborate on the management of wolves.

- The Montana Wolf Management Plan should guide the management of wolves while allowing Montana Fish, Wildlife & Parks management discretion and flexibility to accommodate the unique attributes of each pack and the site-specific characteristics of its home range.

- Implementation of the Montana Wolf Management Plan should be contingent upon adequate funding, shared by state, federal, and private entities.

- The State of Montana should make a long-term funding commitment to the conservation of wolves, commensurate with existing programs for black bears and mountain lions.

- Montana Fish, Wildlife & Parks should take a lead role in the creation and implementation of a science-based information and education program to increase public knowledge with a goal of reducing the emotion

and controversy regarding wolves and their management. The effort should be collaborative with other agencies and non-governmental organizations.

To Ensure Public Safety,

- The general public, in the unlikely need for defense of human life, may use any means, including lethal take, to address an imminent threat, regardless of location or wolf population status.

- Montana Fish, Wildlife & Parks or a cooperating agency will take action when the continued presence of a wolf (or wolves) poses a potential threat to human safety, consistent with existing guidelines established for black bears and mountain lions.

- The State of Montana may seek statutory authority to regulate the ownership of wolf-dog hybrids, as deemed necessary.

To Maintain Viable Wildlife Populations,

- We recognize that wolves have an important role in the ecosystem.

- Wolves should be encouraged to exist in large, contiguous public land areas where the potential for conflict is lowest. Wolves should be permitted in other areas (mixed land ownership), commensurate with social acceptance and subject to the provisions to protect human safety, the integration of management programs for ungulates and carnivores, and the provisions which address wolf/livestock conflicts.

- The Montana Wolf Management Plan should take a proactive approach to integrate the management of ungulates and carnivores and to maintain traditional hunting heritage and wildlife viewing opportunities.

- Ungulate populations should be enhanced wherever possible (subject to landowner tolerance) to support viable wolf populations, to maintain recreational and viewing opportunities, and to minimize the potential for livestock depredation.

- Montana Fish, Wildlife and Parks should initiate and/or support research efforts to enhance understanding of the complex interactions and population dynamics of ungulate/carnivore ecosystems, in addition to applying adaptive harvest management principles to achieve more effective management.

- Ungulate harvest should be balanced with maintaining sufficient prey populations to sustain viable wolf populations and prevent reclassification under federal law.

- Montana Fish, Wildlife & Parks should have a monitoring program for wolves to document wolf persistence and reproduction in a manner that balances precision and cost-effectiveness.

- Opportunities for regulated public take of wolves through hunting and trapping should be provided as wolf numbers increase, but opportunity should also be consistent with sustaining viable wolf populations into the future, thereby precluding reclassification under federal law.

To Protect the Livestock Industry,

- Economic and other incentives should be provided to livestock producers who voluntarily implement best management practices that decrease the potential for wolf/livestock conflicts.

- Livestock owners should have a quick and efficient means available to them to address wolf depredation problems.

- There should be a positive relationship between wolf numbers and landowner flexibility to address wolf depredation problems on private lands. As wolf numbers increase, landowner flexibility should increase.

- The Council acknowledges that tolerance for wolves on private property is fundamental to wolf population recovery and range expansion. Furthermore, we recognize that wolf recovery in Montana will result in the loss of personal property by wolf predation. Citizens should be compensated for livestock losses at fair market value. Compensation is critical to building tolerance for wolves by citizens who are adversely affected by wolves.

- Montana Fish, Wildlife & Parks funds should not be used to make compensation payments for livestock depredations.

- Montana Department of Livestock and USDA Wildlife Services should take an incremental approach to addressing wolf depredations on livestock, guided by wolf numbers. When wolf numbers are low, more conservative methods should be applied whereas increasingly more aggressive control methods should be applied as wolf numbers increase.

Recommendations

We, the Council, also make the following specific recommendations regarding legislation, funding, and educational efforts necessary for plan implementation.

Legislation

The wolf is listed as a state endangered species in Montana under the Nongame and Endangered Species Conservation Act (87-5-109 MCA) passed in 1973. Under this statute, the wolf is legally protected from take except for specific purposes (scientific, zoological, or educational) or in specific circumstances under a permit issued by the FWP Director. Wolves may also be taken without a permit in emergency situations involving an immediate threat to human life. Action by the Montana Legislature is required to remove a species from a state classification as 'threatened' or 'endangered.'

In 1995, the Montana Legislature passed Senate Bill 394, which amends Title 81 (Department of Livestock) sections by adding the wolf to the definition of predatory animal (81-7-101, MCA). Furthermore, it states, "The Department of Livestock shall conduct the destruction, extermination, and control of predatory animals capable of killing, destroying, maiming, or injuring domestic livestock or domestic poultry, and the protection and safeguarding of livestock and poultry in this state against depredations from these animals" (81-7-102, MCA). This section also states that the Department of Livestock shall "adopt rules applicable to predatory animal control which are necessary and proper for the systematic destruction of the predatory animals by hunting, trapping, and poisoning operations and payments of bounties." The effective date of this Act is "whenever the gray wolf is removed from the list of threatened or endangered species by the appropriate agency of the United States government."

The USFWS will not delist the gray wolf in Montana while the wolf remains classified as a "predatory animal" because FWP would have no ability to regulate take and the Department of Livestock would be required to conduct its extermination. Unless Statute 81-7-101 is amended, Montana would not have adequate regulatory mechanisms in place to assure the USFWS that wolves would not require subsequent reclassification and federal protection under the Endangered Species Act.

Montana Statute 87-3-130 addresses the taking of wildlife to protect persons or livestock. It states that there should be "no criminal liability for the taking of wildlife protected by this chapter if the wildlife is molesting, assaulting, killing, or threatening to kill a person or livestock." After wolves come under state management authority, the Council understands this Statute to also extend to livestock producers protecting their livestock from wolves which are found "molesting, assaulting, killing, or threatening to kill." However, it is unclear whether this statute could also be interpreted to include domestic pets and guarding animals under the concepts of defense of life and protection of livestock.

The Council makes the following legislative recommendations:

- Amend 81-7-101 to remove the wolf from the list of "predatory animals."

- Remove the wolf from its 'endangered' status under the Montana Nongame and Endangered Species Act concurrent with federal action removing the wolf from legal protection under the federal Endangered Species Act.

- Reclassify the wolf as a species "in need of management" consistent with Montana Statutes 87-5-101 through 122, which convey authority to FWP and the FWP Commission to adopt regulations on take, including permitting livestock producers to take depredating wolves, hunting seasons, trapping regulations, etc. The FWP Commission may then confer a big game or furbearer status to the wolf when wolf numbers have increased to the point where regulated public take becomes appropriate. It should be the intent of the FWP Commission that regulated public take provisions allow hunting and trapping activities, subsequent to Commission oversight.

- Amend Statute 87-3-130 to include pets (domestic dogs) and guard dogs (including guard llamas) under the defense of life and property concept, if legal interpretation concludes that they are not already.

Funding

The Council believes that implementation of the Montana Wolf Management Plan should be contingent upon adequate funding. We recommend that the State of Montana pursue all possible funding sources including, but not limited to, public/private foundations, federal or state appropriations, and other private sources.

Education

A wolf management plan for the state will be controversial. Personal opinions, anecdotal experiences, and biases for and against the wolf lead to emotional and often irrational viewpoints, creating a challenging environment in which to manage wolves. Therefore, the Council recognizes the importance, value, and need for an educational program to parallel management activities. The objectives of a sound wolf management education program should be to provide science-based and factual information regarding the wolf and its management in Montana, in the hopes that the public will become more knowledgeable, more objective, and less emotional regarding this species and its management.

Montana Fish, Wildlife & Parks should be the lead agency in the formulation and dissemination of an educational program. However, the information sources should include other state and federal agencies, non-governmental organizations, and tribes. All material provided to FWP and included in the program must be validated as factual and have a foundation of scientific data. Assuring the soundness of information will be the responsibility of FWP. This collaborative approach is also necessary to ensure that different groups do not put out conflicting information, which could undermine agency credibility and erode public acceptance of any wolf management program.

APPENDIX 2

2001 Montana Legislature

SENATE BILL NO. 163: Reclassify Certain Species for Management Purposes

INTRODUCED BY L. GROSFIELD

AN ACT REVISING STATUTES APPLICABLE TO THE MANAGEMENT OF CERTAIN ANIMAL SPECIES; RECLASSIFYING CERTAIN SPECIES TO INCREASE THE STATE'S ABILITY TO MAINTAIN OR REGAIN MANAGEMENT AUTHORITY RATHER THAN HAVING MANAGEMENT AUTHORITY EXERCISED BY THE FEDERAL GOVERNMENT; REVISING THE DEFINITION OF "PREDATORY ANIMAL"; ELIMINATING THE AUTHORITY OF THE DEPARTMENT OF LIVESTOCK TO EXTERMINATE PREDATORY ANIMALS; ALLOWING A PERSON TO PROTECT LIVESTOCK BY KILLING OR ATTEMPTING TO KILL A GRIZZLY BEAR THAT IS IN THE ACT OF ATTACKING OR KILLING LIVESTOCK; ALLOWING THE AMENDMENT OF REGULATIONS FOR A SPECIES IN NEED OF MANAGEMENT WITHOUT LEGISLATIVE APPROVAL; PROVIDING FOR MANAGEMENT OF THE GRAY WOLF IF IT IS REMOVED FROM THE FEDERAL AND STATE LISTS OF THREATENED OR ENDANGERED WILDLIFE; AMENDING SECTIONS 81-7-101, 81-7-102, 81-7-103, 81-7-104, 87-3-127, 87-3-130, AND 87-5-105, MCA; REPEALING SECTION 7, CHAPTER 244, LAWS OF 1995; AND PROVIDING AN IMMEDIATE EFFECTIVE DATE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

Section 1. Section 81-7-101, MCA, is amended to read:

"~~**81-7-101. (Temporary) Definition.** For the purpose of this part the term "wild animal" shall include coyote, lynx, and any other animal causing depredations upon livestock.~~

81-7-101. ~~**(Effective on occurrence of contingency)**~~ **Definition.** For the purpose of this part, the term "predatory animal" includes ~~gray wolf,~~ coyote, red fox,~~,lynx,~~ and any other individual animal causing depredations upon livestock."

Section 2. Section 81-7-102, MCA, is amended to read:

"~~**81-7-102. (Temporary) Department to supervise destruction of predatory animals -- cooperation with other agencies -- administration of moneys.** (1) The department of livestock shall conduct the destruction, extermination, and control of wild animals predatory in nature and capable of killing, destroying, maiming, or injuring domestic livestock or domestic poultry, and the protection and safeguarding of livestock and poultry in this state against depredations from these animals. The department shall formulate the practical programs for accomplishing these objectives in this state and for carrying out the programs in an efficient and practical manner responsive to the need for control in each area of this state.~~

~~(2) The department shall adopt rules applicable to predatory animal control which are necessary and proper for the systematic destruction of the wild animals by hunting, trapping, and poisoning operations and payments of bounties. The department shall make field, area, range, or other orders and instructions, including orders and instructions to hunter and trapper personnel and others, which are appropriate in the various areas at different~~

~~seasons of the year, taking into consideration the habits, presence, migrations, or movements of the animals and their attacks on livestock and poultry, either singly or in packs or bands.~~

~~(3) The department shall cooperate with authorized representatives of the federal government, including the biological survey and the fish and wildlife service, the department of fish, wildlife, and parks, boards of county commissioners, voluntary associations of stockgrowers, sheepgrowers, ranchers, farmers, and sportsmen, and corporations and individuals, in the systematic destruction of wild animals by hunting, trapping, and poisoning operations.~~

~~(4) This section and 81-7-103 do not interfere with or impair the power and duties of the department of fish, wildlife, and parks in the control of predatory animals by the department of fish, wildlife, and parks as authorized by law, or the obligation of the department of fish, wildlife, and parks to expend its funds in cooperation with the department for predatory animal control as required by law. Funds of the department of fish, wildlife, and parks for the cooperative predatory animal control shall be administered and expended by the department of fish, wildlife, and parks.~~

81-7-102. ~~(Effective on occurrence of contingency)~~ Department to supervise destruction of predatory animals -- cooperation with other agencies -- administration of money. (1) The department of livestock shall conduct the destruction~~, extermination,~~ and control of predatory animals capable of killing, destroying, maiming, or injuring domestic livestock or domestic poultry~~,~~ and the protection and safeguarding of livestock and poultry in this state against depredations from these animals. The department shall formulate the practical programs for accomplishing these objectives in this state and for carrying out the programs in an efficient and practical manner responsive to the need for control in each area of this state.

(2) The department shall adopt rules applicable to predatory animal control ~~which~~ that are necessary and proper for the systematic destruction of the predatory animals by hunting, trapping, and poisoning operations and payments of bounties. The department shall make field, area, range, or other orders and instructions, including orders and instructions to hunter and trapper personnel and others, ~~which~~ that are appropriate in the various areas at different seasons of the year, taking into consideration the habits, presence, migrations, or movements of the animals and their attacks on livestock and poultry, either singly or in packs or bands.

(3) The department shall cooperate with authorized representatives of the federal government, including the biological survey and the fish and wildlife service, the department of fish, wildlife, and parks, boards of county commissioners, voluntary associations of stockgrowers, sheepgrowers, ranchers, farmers, and sportsmen, and corporations and individuals, in the systematic destruction of predatory animals by hunting, trapping, and poisoning operations.

(4) ~~This section and~~ Section 81-7-103 and this section do not interfere with or impair the power and duties of the department of fish, wildlife, and parks in the control of predatory animals by the department of fish, wildlife, and parks as authorized by law~~,~~ or the obligation of the department of fish, wildlife, and parks to expend its funds in cooperation with the department for predatory animal control as required by law. Funds of the department of fish, wildlife, and parks for the cooperative predatory animal control must be administered and expended by the department of fish, wildlife, and parks."

Section 3. Section 81-7-103, MCA, is amended to read:

"81-7-103. Administration of funds by the department. The department shall administer and expend for predatory animal ~~extermination and~~ control all money ~~which~~ that is made available to it, including the money allocated for this purpose under 81-7-104 and all money ~~which~~ that is made available to the department by appropriations made by the legislature for predatory animal control by the department. The department shall expend the funds for predatory animal control by all effective means responsive to the necessities of control in various areas of the state, including employment of hunters, trappers, and other personnel, procurement of traps, poisons, equipment, and supplies, and payment of bounties in the discretion of the department at those times of the year it considers advisable."

Section 4. Section 81-7-104, MCA, is amended to read:

~~"81-7-104. (Temporary) Predator control moneys -- use of proceeds. (1) The department of livestock shall allocate a portion of the money from the levy under 15-24-921 for the purpose of protecting livestock in the state against destruction, depredation, and injury by wild animals, whether the livestock is on lands in private ownership, in the ownership of the state, or in the ownership of the United States, including open ranges and all lands in or of the public domain. This protection may be by any means of effective predatory animal destruction, extermination, and control, including systematic hunting and trapping and payment of bounties.~~

~~(2) Money shall be paid out only on claims duly and regularly presented to the department of livestock and approved by the department in accordance with the law applicable either to claims for bounties or for other expenditures necessary and proper for predatory animal control by means and methods other than payment of bounties, as determined by the department. Money designated for predator control shall be available for the payment of bounty claims and for expenditures for planned, seasonal, or other campaigns directed or operated by the department in cooperation with other agencies for the systematic destruction, extermination, and control of predatory wild animals, as determined by the department and its advisory committee. No claims may be approved in excess of moneys available for such purposes, and no warrants may be registered against the moneys.~~

81-7-104. ~~(Effective on occurrence of contingency)~~ Predator control money -- use of proceeds. (1) The department of livestock shall allocate a portion of the money from the levy under 15-24-921 for the purpose of protecting livestock in the state against destruction, depredation, and injury by predatory animals, whether the livestock is on lands in private ownership, in the ownership of the state, or in the ownership of the United States, including open ranges and all lands in or of the public domain. This protection may be by any means of effective predatory animal destruction~~, extermination,~~ and control, including systematic hunting and trapping and payment of bounties.

(2) Money ~~must~~ may be paid out only on claims duly and regularly presented to the department of livestock and approved by the department in accordance with the law applicable either to claims for bounties or for other expenditures necessary and proper for predatory animal control by means and methods other than payment of bounties, as determined by the department. Money designated for predator control must be available for the payment of bounty claims and for expenditures for planned, seasonal, or other campaigns directed or operated by the department in cooperation with other agencies for the systematic destruction~~, extermination,~~ and control of predatory animals, as determined by the department and its advisory committee. Claims may not be approved in excess of money available for those purposes, and warrants may not be registered against the money."

Section 5. Section 87-3-127, MCA, is amended to read:

"**87-3-127. Taking of stock-killing animals.** (1) Livestock owners, their agents, or employees of the department or ~~the~~ a federal ~~fish and wildlife service~~ agency may use dogs in pursuit of stock-killing black bears, stock-killing mountain lions, and stock-killing bobcats. Other means of taking stock-killing black bears, stock-killing mountain lions, and stock-killing bobcats may be used, except ~~the use of~~ the deadfall.

(2) Traps used in capturing bears ~~shall~~ must be inspected twice each day with the inspections 12 hours apart."

Section 6. Section 87-3-130, MCA, is amended to read:

"**87-3-130. Taking of wildlife to protect persons or livestock.** (1) This chapter may not be construed to impose, by implication or otherwise, criminal liability for the taking of wildlife protected by this chapter if the wildlife is ~~molesting, assaulting,~~ attacking, killing, or threatening to kill a person or livestock, except that, for purposes of protecting livestock, a person may not kill or attempt to kill a grizzly bear unless the grizzly bear is in the act of attacking or killing livestock. In addition, a person may kill or attempt to kill a wolf or mountain lion that is in the act of attacking or killing a domestic dog. A person who ~~so~~ takes wildlife protected by this chapter shall notify the department within 72 hours.

(2) A person may not intentionally provide supplemental feed to game animals in a manner that results in an artificial concentration of game animals that may potentially contribute to the transmission of disease. A person who violates this subsection is guilty of a misdemeanor and is subject to the penalty provided in 87-1-102(1). This subsection does not apply to supplemental feeding activities conducted by the department for disease control purposes.

(3) As used in this section, "livestock" includes ostriches, rheas, and emus."

Section 7. Section 87-5-105, MCA, is amended to read:

"**87-5-105. Regulations to manage nongame wildlife.** (1) On the basis of the determinations made pursuant to 87-5-104, the department shall issue management regulations. ~~Such~~ The regulations ~~shall~~ must set forth species or subspecies of nongame wildlife ~~which~~ that the department ~~deems~~ considers to be in need of management pursuant to 87-5-104 through 87-5-106, giving their common and scientific names by species and subspecies. ~~The department may from time to time amend such regulations on the approval of the legislature by adding or deleting therefrom species or subspecies of nongame wildlife.~~

(2) The department shall by ~~such regulations~~ regulation establish ~~proposed~~ limitations relating to taking, possession, transportation, exportation, processing, sale or offer for sale, or shipment ~~as may be deemed~~ considered necessary to manage ~~such~~ nongame wildlife that is designated in need of management. ~~The department may make such changes in the proposed regulations as are consistent with effective management of nongame wildlife as designated by the legislature.~~"

Section 8. Process for delisting of gray wolf -- management following delisting. (1) If the United States fish and wildlife service removes the Northern Rocky Mountain or gray wolf from the United States' list of endangered or threatened wildlife, the department is authorized to remove the wolf from the state list of endangered species upon a determination by the department pursuant to this part that the wolf is no longer endangered.

(2) Following state delisting of the wolf, the department shall manage the wolf as a species in need of management until the department and the commission determine that the wolf no longer needs protection as a species in need of management and can be managed and protected as a game animal. Upon making that determination, the commission may declare the wolf a big game animal or a furbearer and may regulate the taking of a wolf as a big game animal or furbearer.

(3) Following state delisting of the wolf, the department, or the department of livestock, pursuant to 81-7-102 and 81-7-103, may control wolves for the protection and safeguarding of livestock if the control action is consistent with a wolf management plan approved by both the department and the department of livestock.

Section 9. Repealer. Section 7, Chapter 244, Laws of 1995, is repealed.

Section 10. Codification instruction. [Section 8] is intended to be codified as an integral part of Title 87, chapter 5, part 1, and the provisions of Title 87, chapter 5, part 1, apply to [section 8].

Section 11. Effective date. [This act] is effective on passage and approval.

- END -

New language in a bill appears underlined, deleted material appears stricken.

APPENDIX 3

WOLF PLAN IMPLEMENTATION BUDGET

Program / Activity	*Estimated Budget*
Montana Fish, Wildlife & Parks	
Wildlife	
Staff (4.30 FTE):	
Wolf Specialists (4.0 FTE)	$149,516
Operations	$156,000
Enhanced Ungulate Monitoring	$ 50,000
Wildlife Lab (.30 FTE)	$ 8,280
Wildlife Lab Operations	$ 7,000
Total	**$370,796**
Enforcement	
Staff(2.5 FTE):	
Game Wardens (2.5 FTE)	$ 86,250
Operations	$ 70,500
Total	**$156,750**
Information & Education	
Staff (.75 FTE):	
Information Officers (.50 FTE)	$ 29,000
Headquarters Staff (.25 FTE)	$ 14,500
Operations	$ 6,000
Total	**$ 49,500**
Administration	
Staff (.75 FTE)	
Program Coordination (Hdqtrs/Field) (.5 FTE)	$ 27,000
Support Staff (Hdqtrs/Field)(.25 FTE)	$ 10,000
Operations	$ 10,000
Total	***$ 47,000***
Depredation	**$100,000**
Wildlife Services (USDA/APHIS) Cooperative Wolf Damage Management and State Directed Predator Control	
MFWP ANNUAL TOTAL	**$724,046**
Other Agency/Private	
Compensation for Livestock Losses: Estimate based upon current payments by Defenders Of Wildlife Wolf Compensation Trust Fund Program and estimated 20 wolf packs within Montana	**$ 41,250**
Annual Total (Including Compensation)	**$765,296**

APPENDIX 4

Partial Bibliography of Predator-prey Interactions

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APPENDIX 5

Rocky Mountain States: Confirmed Wolf Depredation and Wolf Control, 1987-2000

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	TOTAL
Northwest Montana Recovery Area:															
Cattle	6	0	3	5	2	1	0	6	3	9	16	9	13	10	83
Sheep	10	0	0	0	2	0	0	0	0	0	30	0	19	2	63
Dogs	0	0	0	1	0	0	0	0	2	1	0	0	2	3	9
wolves moved	0	0	4	0	3	0	0	2	2	10	7	0	4	0	32
wolves killed	4	0	1	1	0	0	0	0	0	4	14	4	9	4	41
Yellowstone Recovery Area:															
Cattle									0	0	5	3	4	7	19
Sheep									0	13	67	7	13	39	139
Dogs									1	0	0	4	6	8	19
wolves moved									6	8	14	0	0	6	34
wolves killed									0	1	6	3	9	6	25
Central Idaho Recovery Area:															
Cattle									0	4	1	10	16	15	46
Sheep									0	24	29	5	57	39	154
Dogs									0	0	4	0	5	0	9
wolves moved									0	5	0	3	15	10	33
wolves killed									0	1	1	0	6	10	18
Total, 3 States, 3 Recovery Areas:															
Cattle	6	0	3	5	2	1	0	6	3	13	22	22	33	32	148
Sheep	10	0	0	0	2	0	0	0	0	37	126	12	89	80	356
Dogs	0	0	0	1	0	0	0	0	3	1	4	4	13	11	37
wolves moved	0	0	4	0	3	0	0	2	8	23	21	3	19	16	99
wolves killed*	4	0	1	1	0	0	0	0	0	6	21	7	24	20	84

* Includes 2 wolves legally shot by ranchers. Others killed in government control efforts.

Source: U.S. Fish and Wildlife Service, Nez Perce Tribe, National Park Service, and USDA Wildlife Services. 2001. Rocky Mountain Wolf Recovery 2000 Annual Report. USFWS, Helena Montana. 35pp.

OR

http://mountain-prairie.fws.gov/wolf/annualrpt00/

Appendix 6

SHEEP AND LAMB LOSSES

By Non-Predator Cause and Number of Head, Montana, USA*

1984-2000

Last updated February 27, 2001

NON-PREDATOR											
Year	Weather Conditions	Disease	Poison	Lambing Complic-ations	On Back	Old Age	Theft	Other	Total Non-Predator	Un-known Causes	Total Loss
	Number of Head										
2000	7,000	9,900	1,900	7,700	1,300	5,700	400	3,400	37,300	9,800	66,000
1999	8,600	12,400	1,500	6,900	1,000	3,900	1,200	1,300	36,800	6,900	64,000
1998	10,000	9,300	1,800	9,400	1,000	4,900	700	1,600	38,700	6,500	67,000
1997	26,200	7,800	1,500	6,500	800	4,100	1,300	900	49,100	8,900	85,000
1996	14,500	6,700	1,300	6,600	1,200	4,500	2,400	2,000	39,200	12,600	83,000
1995	14,300	10,000	1,900	8,400	1,200	5,700	2,000	3,400	46,900	8,000	92,000
1994	11,800	15,700	2,200	10,700	1,900	6,500	2,900	2,100	53,800	7,300	104,000
1993	12,000	12,400	2,300	15,700	3,000	7,100	3,300	3,600	59,400	8,400	108,000
1992	11,900	12,300	2,000	16,600	2,300	6,300	2,900	8,700	63,000	7,800	112,000
1991	21,500	14,500	2,600	25,000	2,600	7,300	4,100	5,900	83,500	13,600	142,000
1990	19,100	14,500	2,900	21,700	2,500	9,200	2,500	7,500	79,900	14,000	133,000
1989	23,400	12,900	2,500	17,400	2,600	10,900	3,400	7,700	80,800	24,300	144,000
1988	15,900	15,800	3,400	13,200	3,000	9,500	5,900	18,000	84,700	22,200	150,000
1987	16,900	16,500	4,700	14,000	3,600	12,000	5,500	6,600	79,800	20,300	137,000
1986	18,000	16,000	4,700	8,800	3,300	11,300	3,700	6,300	72,100	17,800	132,000
1985	14,100	11,200	3,600	11,900	3,100	7,500	5,000	3,400	59,800	15,500	127,000
1984	72,800	9,600	2,300	10,700	2,200	5,600	3,200	5,300	111,700	16,600	180,000

1/ Category not available that year. -- Denotes less than 100 head. Please note: Totals may not add due to rounding.

*wolf depredation confirmed by USDA, Wildlife Services is presented in Appendix 5

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, Montana Field Office, Helena, Montana: http://www.nass.usda.gov/mt/livestock/sh&llos4.htm

SHEEP AND LAMB LOSSES

By Predator Cause and Number of Head, Montana, USA*

1984-2000

Last updated February 27, 2001

PREDATOR										
Year	Fox	Dog	Coyote	Eagle	Bobcat	Bear	Mountain Lion	Other Animals	Unknown Predators	Total Predators
	Number of Head									
2000	1,000	1,300	12,900	1,600	--	900	400	100	700	18,900
1999	1,200	600	15,100	1,700	--	400	400	--	900	20,300
1998	2,000	1,200	14,900	2,000	--	300	600	100	700	21,800
1997	2,200	1,000	19,900	2,400	100	400	500	--	500	27,000
1996	2,700	1,400	22,600	2,200	200	800	500	--	800	31,200
1995	3,400	1,600	28,000	2,700	--	300	500	--	600	37,100
1994	6,000	1,000	28,500	5,300	300	600	1,000	200	--	42,900
1993	3,300	1,700	30,700	2,500	200	700	1,000	100	--	40,200
1992	5,000	1,800	31,100	1,900	--	800	600	--	--	41,200
1991	4,900	3,500	33,700	1,300	100	600	600	200	--	44,900
1990	4,000	1,600	29,700	2,200	--	700	600	300	--	39,100
1989	3,500	1,500	28,200	800	400	1,000	500	--	--	35,900
1988	4,200	3,100	31,000	2,700	300	1,300	400	100	--	43,100
1987	2,900	3,100	26,400	2,700	100	1,200	300	200	--	36,900
1986	5,100	2,900	30,500	2,000	100	1,100	400	1/	--	42,100
1985	4,300	1,500	41,600	2,500	100	1,400	300	1/	--	51,700
1984	6,200	2,100	38,300	2,500	200	1,400	1/	1,000	--	51,700

1/ Category not available that year. -- Denotes less than 100 head. Please note: Totals may not add due to rounding.

*wolf depredation confirmed by USDA, Wildlife Services is presented in Appendix 5

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, Montana Field Office, Helena, Montana; http://www.nass.usda.gov/mt/livestock/sh&llos3.htm

CATTLE AND CALF LOSSES

Itemized by Cause, Montana, USA 1995*

TYPE	COWS	CALVES	TOTAL
coyote	(0)	(1,100)	(1,100)
dog	(0)	(200)	(200)
lion/bobcat	(200)	(100)	(300)
other predators	(200)	(400)	(600)
PREDATORS TOTAL	400	1800	2,200
DIGESTIVE	2,600	10,000	12,600
RESPIRATORY	3,600	8,600	12,200
CALVING	2,000	13,900	15,900
WEATHER	2,700	13,100	15,800
POISON	800	900	1,700
THEFT	0	200	200
OTHER	5,000	3,600	8,600
UNKNOWN	5,800	4,900	10,700
TOTAL LOSSES, ALL CAUSES	22,900	57,000	79,900

*wolf depredation confirmed by USDA, Wildlife Services is presented in Appendix 5

*Most recent itemized data available; wolf depredation confirmed by USDA, Wildlife Services is presented in Appendix 5

Source: U.S. Department of Agriculture, National Agricultural Statistics Service, Montana Field Office, Helena, Montana

APPENDIX 7

Compensation payments by Defenders of Wildlife for wolf depredation in states and in the Northern Rockies Recovery Areas, respectively, from 1987 to April, 2001. Cents are not reported.

LOCATION	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
MONTANA	$3,049		$1,730	$4,700	$1,250	$374		$2,322	$1,633	$3,506	$16,495	$4,810	$12,062	$7,935	$1,804	$61,670
IDAHO										$3,977	$3,761	$6,380	$15,694	$24,772	$1,245	$55,829
WYOMING											$12,434	$500	$4,957	$14,338		$32,229
NM/AZ												$466	$2,225	$3,400		$6,091
CANADA								$3,379								$3,379
TOTAL	$3,049	$0	$1,730	$4,700	$1,250	$374	$0	$5,701	$1,633	$7,483	$32,690	$12,156	$34,938	$50,446	$3,049	$159,200

LOCATION	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Northwest Montana Recovery Area	$3,049		$1,730	$4,700	$1,250	$374		$1,772		$1,485	$7,554	$3,835	$9,567	$4,357	$1,804	$41,477
Central Idaho Exp. Area.										$4,777	$7,492	$6,855	$15,079	$23,022	$1,245	$58,470
Greater Yellowstone Exp. Area								$550	$1,633	$1,221	$17,644	$1,000	$8,067	$19,666		$49,781
TOTAL	$3,049	$0	$1,730	$4,700	$1,250	$374	$0	$2,320	$1,633	$7,483	$32,690	$11,690	$32,713	$47,046	$3,049	$149,730

APPENDIX 8

DRAFT MFWP PUBLIC INFORMATION PLAN

September 2001

INTRODUCTION

Montana Fish, Wildlife & Parks will soon take on management responsibility for the state's gray wolf population.

An accepted and approved Montana Wolf Management Plan will allow MFWP to obtain local management of wolves. The plan must be accepted and approved by the U.S. Fish and Wildlife Service and by the people of Montana.

An estimated 40 breeding wolf packs exist in the Montana, Idaho, and Wyoming recovery areas. A federal plan currently calls for establishing 10 packs in each of the three areas for three years before delisting can occur. Federal wolf managers, however, say that the biological intent of the recovery plan could also be met with a total of 30 packs evenly distributed in the tri-state area. A total of 30 packs for three years could trigger delisting, a process that could begin in 2003.

Once delisted the wolves will come under state management.

MFWP is preparing now to answer questions that will emerge as the state moves toward developing a balanced wolf management plan for Montana. Because wolf management procedures will be closely examined and arouse controversy, MFWP seeks to build a balanced management approach that acknowledges the complexity of the political, social and environmental factors associated with wolves and their management.

Basic questions Montanans and others will expect to have answered include:

- How will wolves be managed?
- What areas will wolves be permitted to inhabit?
- Should Montanans be concerned about public safety?
- Who will fund wolf management in Montana?
- What impacts will wolves have on wildlife populations?
- What impacts will wolves have on livestock?

This draft public information plan will serve as MFWP's initial guide as it prepares to inform the public in Montana and across the nation about gray wolf management in Montana.

OBJECTIVES

1. Increase public awareness of the gray wolf and its recovery in Montana and increase awareness that once delisted the gray wolf will come under state management.

   Answer the following questions:
   - What is a gray wolf?
   - Where are gray wolves found?
   - Why is MFWP going to manage wolves?
   - How will wolves impact wildlife?
   - How will wolves impact livestock?
   - What are the legal aspects of state-run wolf management?
   - What is being done to prepare Montanans for state management of wolves?
   - How can the public participate?

2. Increase awareness of the status of the gray wolf in Montana, the delisting process and delisting milestones.

3. Increase awareness of the array of management tools MFWP will employ once the gray wolf is delisted in Montana.

STRATEGIES

To meet the above objectives, a cooperative approach will be necessary. Partnerships among state and federal agencies, Indian tribes, hunting and conservation groups, the agricultural community, schools, civic groups and others are vital for success. MFWP will also employ targeted information delivery based on MFWP surveys that show where and how Montanans and others get information on natural resource issues. Most strategies will have an associated MFWP website component. Initial strategies include:

Internal Affairs

Use MFWP internal communication vehicles to highlight and explain the Montana Wolf Management Plan

- Prepare a Montana Wolf Management Plan primer for MFWP employees to include information, status and logistics of Montana's wolf management responsibilities.
- Fresh Tracks internal newsletter updates about Montana Wolf Management Plan progress
- Regional and division meetings will include presentations on the Montana Wolf Management Plan

Media

Use statewide media to highlight and explain the Montana Wolf Management Plan

- Prepare a "Montana Wolf Management Plan" news and information kit for news reporters.
- Use paid radio advertising and Public Service Announcements to reach a broad spectrum of the public for an initial announcement focusing on Montana Wolf Management Plan participation and comment; and develop more announcements as the project moves forward.
- Use paid television advertising and PSAs to highlight important information.
- Include selected paid advertisements in local newspapers.
- Expand and update MFWP's Wolf Management website.
- Issue regular news releases to highlight the Montana Wolf Management Plan launch and its progress.
- Produce MFWP "Outdoor Reports" for television news broadcasts

Displays and Information

Use displays and prepared information to highlight and explain the Montana Wolf Management Plan

- Produce a quality full-color pamphlet--suitable for direct mailings, meeting handouts, and website placement--that outlines Montana Wolf Management Plan goals, recovery triggers, management options, and wolf ecology and history in Montana.
- Produce associated portable display and materials for meetings, lobbies, and gatherings.
- Include project specific information in interest group newsletters and MFWP's legislator updates.
- Include project specific information in MFWP license agent newsletters.
- Include project specific information in MFWP Hunter Education newsletters

Presentations

Use statewide presentations that could include, video, PowerPoint, web-based PowerPoint, 35mm slides, and associated educational materials to explain the Montana Wolf Management Plan

- Present objective "wolves in Montana" programs at local schools
- Present objective "wolves in Montana" programs for civic and interest groups
- Conduct or cooperate in "wolves in Montana" discussions at statewide meetings or conventions. For example at the Montana Bowhunters Association, Montana Outfitters and Guides Association, Montana Livestock Association, and Montana Wildlife Federation and other annual gatherings.
- Work closely with MFWP biologists, information center staff, and wardens to enhance their direct contacts; also include biologists and wardens in school presentations and other presentations.

Species of Concern

Fish

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
White Sturgeon (Kootenai River Population)	*Acipenser transmontanus pop 1*	G4T1Q	S1	E	S	
Torrent Sculpin	*Cottus rhotheus*	G5	S3?		S	
Spoonhead Sculpin	*Cottus ricei*	G5	S3?			
Blue Sucker	*Cycleptus elongatus*	G4	S2S3			SS
Shortnose Gar	*Lepisosteus platostomus*	G5	S1			SS
Sturgeon Chub	*Macrohybopsis gelida*	G2	S2			SS
Sicklefin Chub	*Macrohybopsis meeki*	G3	S1		S	SS
Yellowstone Cutthroat Trout	*Oncorhynchus clarki bouvieri*	G4T2	S2		S	SS
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*	G4T3	S2		S	SS
Columbia River Redband Trout	*Oncorhynchus mykiss gairdneri*	G5T4	S1		S	
Trout-perch	*Percopsis omiscomaycus*	G5	S2			
Northern Redbelly X Finescale Dace	*Phoxinus eos x phoxinus neogaeus*	HYB	S3			SS
Paddlefish	*Polyodon spathula*	G4	S1S2			SS
Bull Trout	*Salvelinus confluentus*	G3	S2	T	S	
Pallid Sturgeon	*Scaphirhynchus albus*	G1	S1	E		
Pearl Dace	*Semotilus margarita*	G5	S2			SS
Sauger	***Stizostedion canadense***	**G5**	**S2**			
Montana Arctic Grayling	*Thymallus arcticus montanus*	G5T1Q	S1	C	S	SS

Amphibians

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Coeur D'alene Salamander	*Plethodon idahoensis*	G3	S2		S	SS
Boreal Toad	*Bufo boreas*	G4	S3			
Northern Leopard Frog	*Rana pipiens (east of the continental divide)*	G5	S3		S	SS
Northern Leopard Frog	*Rana pipiens (west of the continental divide)*	G5	S1		S	SS
Great Plains Toad	***Bufo cognatus***	**G5**	**S3**			

Reptiles

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Sagebrush Lizard	***Sceloporus graciosus***	**G5**	**S3**			
Western Skink	***Eumeces skiltonianus***	**G5**	**S3**			
Spiny Softshell	*Apalone spinifera*	G5	S3			SS
Snapping Turtle	*Chelydra serpentina*	G5	S3			SS
Western Hognose Snake	*Heterodon nasicus*	G5	S3			
Milk Snake	*Lampropeltis triangulum*	G5	S2			
Smooth Green Snake	*Liochlorophis vernalis*	G5	S2S3			

Birds

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Common Loon	*Gavia immer*	G5	S1S2B,SZN		S	SS
American White Pelican	*Pelecanus erythrorhynchos*	G3	S3B,SZN			
Black-crowned Night-heron	*Nycticorax nycticorax*	G5	S3B?,SZN			
White-faced Ibis	***Plegadis chihi***	**G5**	**S1B,SZN**			SS
Trumpeter Swan	*Cygnus buccinator*	G4	S2B,S2N		S	SS
Harlequin Duck	*Histrionicus histrionicus*	G4	S2B,SZN		S	SS
Bald Eagle	*Haliaeetus leucocephalus*	G4	S3B,S3N	T		
Northern Goshawk	*Accipiter gentilis*	G5	S3S4		S	SS
Ferruginous Hawk	*Buteo regalis*	G4	S3B,SZN			SS
Peregrine Falcon	*Falco peregrinus*	G4	S2B, SZN		S	SS
White-tailed Ptarmigan	***Lagopus leucurus***	**G5**	**S3**			
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	G4T3	S1		S	SS
Yellow Rail	*Coturnicops noveboracensis*	G4	S1B,SZN			
Whooping Crane	*Grus americana*	G1	S1N	E		
Piping Plover	*Charadrius melodus*	G3	S2B,SZN	T		
Mountain Plover	*Charadrius montanus*	G2	S2B,SZN	PT		

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Birds

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Franklin's Gull	*Larus pipixcan*	G4G5	S3B,SZN			
Caspian Tern	*Sterna caspia*	G5	S2B,SZN			
Common Tern	*Sterna hirundo*	G5	S3B,SZN			
Forster's Tern	*Sterna forsteri*	G5	S2B,SZN			
Interior Least Tern	*Sterna antillarum athalassos*	G4T2Q	S1B,SZN	E		
Black Tern	*Chlidonias niger*	G4	S3B,SZN			SS
Yellow-billed Cuckoo	*Coccyzus americanus*	G5	S3B,SZN			
Barn Owl	***Tyto alba***	**G5**	**S1B,S1N**			
Great Gray Owl	*Strix nebulosa*	G5	S3			SS
Burrowing Owl	*Athene cunicularia*	G4	S3B,SZN		S	SS
Flammulated Owl	*Otus flammeolus*	G4	S3B,SZN		S	SS
Northern Hawk Owl	***Surnia ulula***	**G5**	**S1B,S1N**			
Black Swift	*Cypseloides niger*	G4	S3B,SZN			
Broad-tailed Hummingbird	***Selasphorus platycercus***	**G5**	**S1B,SZN**			
Black-backed Woodpecker	*Picoides arcticus*	G5	S3		S	SS
Lewis's Woodpecker	***Melanerpes lewis***	**G5**	**S3S4B,SZN**			
Red-headed Woodpecker	***Melanerpes erythrocephalus***	**G5**	**S3S4B,SZN**			
Alder Flycatcher	*Empidonax alnorum*	G5	S1B,SZN			
Olive-sided Flycatcher	***Contopus cooperi***	**G5**	**S3B,SZN**			
Cassin's Kingbird	*Tyrannus vociferans*	G5	**S2B?,SZN**			
Boreal Chickadee	***Poecile hudsonica***	**G5**	**S1S2**			
Sedge Wren	***Cistothorus platensis***	**G5**	**S1B,SZN**			
Blue-gray Gnatcatcher	*Polioptila caerulea*	G5	**S1B,SZN**			
Eastern Bluebird	***Sialia sialis***	**G5**	**S2B, SZN**			
Sprague's Pipit	***Anthus spragueli***	**G4**	**S3S4B,SZN**		**S**	
Black-and-white Warbler	***Mniotilta varia***	**G5**	**S2S3B,SZN**			
Dickcissel	*Spiza americana*	G5	S1S2B,SZN			SS
Baird's Sparrow	*Ammodramus bairdii*	G4	S3S4B,SZN		S	SS
Le Conte's Sparrow	*Ammodramus leconteii*	G4	S1S2B,SZN			SS
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	G5	S1B,SZN			
Black Rosy-Finch	***Leucosticte atrata***	**G4**	**S3**			

Mammals

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Preble's Shrew	***Sorex preblei***	**G4**	**S3**			**SS**
Dwarf Shrew	*Sorex nanus*	G4	S3			
Merriam's Shrew	*Sorex merriami*	G5	S3			SS
Fringed Myotis	*Myotis thysanodes*	G5	S3			
Spotted Bat	*Euderma maculatum*	G4	S1		S	SS
Townsend's Big-eared Bat	*Corynorhinus townsendii*	G4	S2S3		S	SS
Pallid Bat	***Antrozous pallidus***	**G5**	**S1**		**S**	
Black-tailed Jack Rabbit	*Lepus californicus*	G5	S2S3			
Pygmy Rabbit	*Brachylagus idahoensis*	G4	**S3**		S	SS
Uinta Chipmunk	*Tamias umbrinus*	G5	**S3**			
Black-tailed Prairie Dog	*Cynomys ludovicianus*	G4	S3S4	C	S	SS
White-tailed Prairie Dog	*Cynomys leucurus*	G4	S1		S	SS
Great Basin Pocket Mouse	*Perognathus parvus*	G5	**S2**			
Hispid Pocket Mouse	*Chaetodipus hispidus*	G5	S1			
Northern Bog Lemming	*Synaptomys borealis*	G4	S2		S	SS
Meadow Jumping Mouse	*Zapus hudsonius*	G5	S2S3			SS
Gray Wolf	*Canis lupus*	G4	**S2S3**	E		
Swift Fox	*Vulpes velox*	G3	**S3**		S	SS
Grizzly Bear	*Ursus arctos horribilis*	G4T3	**S2S3**	T		
Fisher	*Martes pennanti*	G5	**S3**		S	SS
Black-footed Ferret	*Mustela nigripes*	G1	**S1**	E		
Western Spotted Skunk	***Spilogale gracilis***	**G5**	**S1**			**SS**
North American Wolverine	*Gulo gulo luscus*	G5T4	**S3**		S	SS
Lynx	*Lynx canadensis*	G5T	**S3**	T		
Woodland Caribou	*Rangifer tarandus caribou*	G5T4	SX			
American Bison (free ranging herds)	**Bos bison**	**G3**	**S2**			

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Invertebrates- Mollusks

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Striate Disc	***Discus shimeki***	**G4**	**S1**			
Mission Range Disc	*Discus brunsoni*	G1	S1			
Marbled Jumping-slug	*Hemphillia danielsi*	G1G3	S1S3			
Spotted Slug	*Magnipelta mycophaga*	G2G3	S1S3			
Sheathed Slug	*Zacoleus idahoensis*	G3G4	S2S3			
Alpine Mountainsnail	*Oreohelix alpina*	G1	S1			
Bitterroot Mountainsnail	*Oreohelix amariradix*	G1G2	S1S2			
Keeled Mountainsnail	*Oreohelix carinifera*	G1	S1			
Carinate Mountainsnail	*Oreohelix elrodi*	G1	S1			
Berry's Mountainsnail	*Oreohelix strigosa berryi*	G5T2	S1S2			
Gallatin Mountainsnail	*Oreohelix yavapai mariae*	G4?T1	S1			
Russell Mantleslug	*Udosarx lyrata russelli*	G1	S1			
Rocky Mountain Duskysnail	*Lyogyrus greggi*	G3G4	S1			
Columbia Pebblesnail	*Fluminicola fuscus*	G2G3	SX			
Rocky Mountain Capshell	*Acroloxus coloradensis*	G?	S1			
Flathead Pondsnail	***Stagnicola elrodi***	**G1**	**S1**			
Largemouth Pondsnail	*Stagnicola elrodianus*	G1	S1			
Mountain Marshsnail	*Stagnicola montanensis*	G3	S1S3			
Shortface Lanx	*Fisherola nuttalli*	G2?	S1S3			
Large-mantle Physa	*Physa megalochlamys*	G3	S1			

Invertebrates- Insects

Common Name	Scientific Name	Global Rank	2000 State Rank	USFWS	USFS	BLM
Warm Spring Zaitzevian Riffle Beetle	***Zaitzevia thermae***	**G1**	**S1**	C		
Brown's Microcylloepus Riffle Beetle	*Microcylloepus browni*	G1	S1			
A Mayfly	*Caenis youngi*	G3	S2			
Powesheik Skipperling	***Oarisma powesheik***	**G2G3**			**S**	
Ottoe Skipper	***Hesperia ottoe***	**G3G4**	**S?**		**S**	
Tawny Crescent	*Phyciodes batesii*	G4	S2S3		S	
Gillette's Checkerspot	*Euphydryas gillettii*	G3	S3			
Eastern Ringtail	*Erpetogomphus designatus*	G5	S1			
Subarctic Darner	*Aeshna subarctica*	G5	S1S2			
Ringed Emerald	*Somatochlora albicincta*	G5	S1S3			
Brush-tipped Emerald	*Somatochlora walshii*	G5	S1S2			
Western Pondhawk	*Erythemis collocata*	G5	S1S2			
Boreal Whiteface	*Leucorrhinia borealis*	G5	S1			
Subarctic Bluet	*Coenagrion interrogatum*	G5	S1S2			
Last Best Place Damselfly	*Enallagma optimolocus*	G1G3Q	S1S3			
A Stonefly	*Isocapnia crinita*	G4	S2			
A Stonefly	*Isocapnia integra*	G4	S2			
A Stonefly	*Utacapnia columbiana*	G4	S2			
Meltwater Lednian Stonefly	*Lednia tumana*	G1	S1			
A Stonefly	*Zapada cordillera*	G3	S2			
Western Glacier Stonefly	*Zapada glacier*	G3	S1			
A Stonefly	*Isoperla petersoni*	G4	S2?			
Alexander's Rhyacophilan Caddisfly	*Rhyacophila alexanderi*	G2	S2			
A Caddisfly	*Rhyacophila ebria*	G1?	S1?			
A Rhyacophilan Caddisfly	*Rhyacophila newelli*	G2?	S2?			
A Rhyacophilan Caddisfly	*Rhyacophila glacieri*	G1	S1			
An Agapetus Caddisfly	*Agapetus montanus*	G2?	S2?			
An Amphipod	***Stygobromus montanensis***	**G1G2**	**S1S2**			
An Amphipod	***Stygobromus obscurus***	**G1G2**	**S1S2**			
An Amphipod	***Stygobromus puteanus***	**G1G2**	**S1S2**			
An Isopod	***Satmasettus steganothrix***	**G1G2**	**S1S2**			
A Phalangid	***Cryptobunus cavicolus***	**G1G2**	**S1S2**			
A Springtail	***Oncopodura cruciata***	**G1G2**	**S1S2**			

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Species on Review

Fish

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Shorthead Sculpin	*Cottus confusus*	G5	SU			
Brook Stickleback	*Culaea inconstans*	G5	SU			
Iowa Darter	*Etheostoma exile*	G5	SU			
Brassy Minnow	*Hybognathus hankinsoni*	G5	SU			
Plains Minnow	*Hybognathus placitus*	G5	SU			
Burbot	*Lota lota*	G5	SU		S	
Northern Red-bellied Dace	*Phoxinus eos*	G5	SU			
Pygmy Whitefish	*Prosopium coulteri*	G5	SU			
Creek Chub	*Semotilus atromaculatus*	G5	SU			

Reptiles

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Pygmy Short-horned Lizard	*Phrynosoma douglasi*	G5	SU			
Short-horned Lizard	*Phrynosoma hernandesi*	G5	SU			
Common Garter Snake	*Thamnophis sirtalis*	G5	SU			

Amphibians

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Great Basin Spadefoot	*Spea intermontana*	G5	SR			
Bullfrog	*Rana catesbeiana*	G5	SU			
Wood Frog	*Rana sylvatica*	G5	SR			
Plains Spadefoot	*Spea bombifrons*	G5	SU			
Canadian Toad	*Bufo hemiophrys*	G4	SRF			
Idaho Giant Salamander	*Dicamptodon aterrimus*	G3	SRF			

Birds

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Clark's Grebe	*Aechmophorus clarkii*	G5	SU			
Great Blue Heron	*Ardea herodias*	G5	SU			
Black-necked Stilt	*Himantopus mexicanus*	G5	SU			
Wilson's Phalarope	*Phalaropus tricolor*	G5	SU			
Black-billed Cuckoo	*Coccyzus erythropthalmus*	G5	SU			
Eastern Screech-Owl	*Otus asio*	G5	SU			
Western Screech-Owl	*Otus kennicottii*	G5	SU			
Short-eared Owl	*Asio flammeus*	G5	SU			
Common Poorwill	*Phalaenoptilus nuttallii*	G5	SU			
Chimney Swift	*Chaetura pelagica*	G5	SU			
Williamson's Sapsucker	*Sphyrapicus thyroideus*	G5	SU			
Three-toed Woodpecker	*Picoides tridactylus*	G5	SU			SS
Cassin's Vireo	*Vireo cassinii*	G5	SU			
Plumbeous Vireo	*Vireo plumbeous*	G5	SU			
Sage Thrasher	*Oreoscoptes montanus*	G5	SU			
Tennessee Warbler	*Vermivora peregrina*	G5	SU			
Ovenbird	*Seiurus aurocapillus*	G5	SU			
Sage Sparrow	*Amphispiza belli*	G5	SU			SS
Bobolink	*Dolichonyx oryzivorus*	G5	SU			
Orchard Oriole	*Icterus spurius*	G5	SU			

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Species on Review (cont'd)

Mammals

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Northern Myotis	*Myotis septentrionalis*	G4	SU			
Eastern Red Bat	*Lasiurus borealis*	G5	SU			
Pygmy Shrew	*Sorex hoyi*	G5	SU			
Yuma Myotis	*Myotis yumanensis*	G5	SU			
Eastern Cottontail	*Sylvilagus flondanus*	G5	SU			

Invertebrates

Common Name	*Scientific Name*	Global Rank	2001 State Rank	FWS Status	USFS Status	BLM Status
Fir Pinwheel	*Radiodiscus abietum*	GU	SU			
Humped Coin	*Polygyrella polygyrella*	GU	SU			
Lyre Mantleslug	*Udosarx lyrata lyrata*	GU	SU			
Prairie Sprite	*Promenetus exacuous megas*	GU	SU			
Pacific Spiketail	*Cordulegaster dorsalis*	G5	SU			
Columbia Pebblesnail	*Fluminicola fuscus*	G2G3	SU			
Humped Coin	*Polygyrella polygyrella*	GU	SU			
Lyre Mantleslug	*Udosarx lyrata lyrata*	GU	SU			
Prairie Sprite	*Promenetus exacuous megas*	GU	SU			
Black Petaltail	*Tanypteryx hageni*	G3	SR			
Pacific Spiketail	*Cordulegaster dorsalis*	G5	SU			
Plains Clubtail	*Gomphus extemus*	G5	SU			
Sinuous Snaketail	*Ophiogomphus occidentis*	G4	SU			
Canada Damer	*Aeshna canadensis*	G5	SU			
Lance-tipped Darner	*Aeshna constricta*	G5	SU			
Blue-eyed Damer	*Aeshna multicolor*	G5	SU			
Zigzag Damer	*Aeshna sitchensis*	G5	SU			
Black-tipped Damer	*Aeshna tuberculifera*	G4	SU			
Illinois River Cruiser	*Macromia illinoiensis*	G5	SR			
Ocellated Emerald	*Somatochlora minor*	G5	SU			
Bleached Skimmer	*Libellula composita*	G3	SR			
Hoary Skimmer	*Libellula nodisticta*	G3	SR			
Wandering Glider	*Pantala flavescens*	G5	SU			
Red-veined Meadowhawk	*Sympetrum madidum*	G4	SU			
Sweetflag Spreadwing	*Lestes forcipatus*	G5	SU			
Variable Dancer	*Argia fumipennis violacea*	G5T5	SU			
Paiute Dancer	*Argia alberta*	G4	SU			
Prairie Bluet	*Coenagrion angulatum*	G5	SU			
Familiar Bluet	*Enallagma civile*	G5	SU			
Alkali Bluet	*Enallagma clausum*	G5	SU			
Horned Clubtail	*Arigomphus comutus*	G4	SU			
An amphipod	*Stygobromus sp 1*	G1G2	SU			

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Species of Potential Concern

Birds

Common Name	Scientific Name	Global Rank	2001 State Rank	FWS	USFS	BLM
Horned Grebe	*Podiceps auritus*	G5	S4			
Swainson's Hawk	*Buteo swainsoni*	G5	S4			SS
Greater Sage-Grouse	*Centrocercus urophasianus*	G4	S4		S	SS
Long-billed Curlew	*Numenius americanus*	G5	S4			SS
Loggerhead Shrike	*Lanius ludovicianus*	G5	S4		S	
Brewer's Sparrow	*Spizella breweri*	G5	S4			
Grasshopper Sparrow	*Ammodramus savannarum*	G5	S4			
Lark Bunting	*Calamospiza melanocorys*	G5	S4			
McCown's Longspur	*Calcarius mccownii*	G5	S4			
Chestnut-collared Longspur	*Calcarius ornatus*	G5	S4			

Species Dropped from List

Common Name	Scientific Name	Global Rank	1999 State Rank
Tailed Frog	*Ascaphus truei*	G4	S4
Boreal Owl	*Aegolius funereus*	G5	S4
Bearmouth Mountainsnail	*Oreohelix sp 3**	G1G2	S1S2
Drummond Mountainsnail	*Oreohelix sp 4**	G1	S1
Brunson Mountainsnail	*Oreohelix sp 5**	G1G2	S1S2
Kintla Lake Mountainsnail	*Oreohelix sp 6**	G1	S1
Kitchen Creek Mountainsnail	*Oreohelix sp 7**	G1G2	S1S2
Missoula Mountainsnail	*Oreohelix sp 10**	G1G3	S1S3
Subcarinate Mountainsnail	*Oreohelix sp 11**	G1	S1
Byme Resort Mountainsnail	*Oreohelix sp 31**	G1G2	S1S2
Washington Duskysnail	*Amnicola sp 2**	G1	S1

*MTNHP recommends these taxa, thought to be new but as yet undescribed in the scientific literature be dropped until they are documented in publication.

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APPENDIX 3

NOXIOUS WEEDS OF MONTANA

Invasive non-native species are now one of the leading threats to the integrity of our nation's forests, grasslands, and waterways. However, the impact of non-native species on our economy and ecological systems is often not widely recognized. Source: County Noxious Weed Control Act State of Montana Department of Agriculture Helena, Montana.

Category 1 Noxious Weeds

Consists of weeds that are currently established and generally widespread in many counties of the state. Management criteria include awareness and education, containment and suppression of existing infestations, and prevention of new infestations. These weeds are capable of rapid spread and render land unfit or greatly limit beneficial uses.

Canada thistle (*Cirsium arvense*)
Russian knapweed (*Centaurea repens*)
Spotted knapweed (*Centaurea maculosa*)
Diffuse knapweed (*Centaurea diffusa*)
Dalmatian toadflax (*Linaria dalmatica*)
Field bindweed (*Convolvulus arvensis*)
St. Johnswort (*Hypericum perforatum*)
Sulfur (erect) cinquefoil (*Potentilla recta*)
Whitetop or Hoary cress (*Cardaria draba*)
Leafy spurge (*Euphorbia esula*)
Common Tansy (Tanacetum vulgare)
Ox-eye Daisy (Chrysanthemum leucanthemum L.)
Houndstounge (Cynoglossum officinale L.)

Category 2 Noxious Weeds

Consists of weeds that have recently been introduced into the state or are rapidly spreading from their current infestation sites. These weeds are capable of rapid spread and invasion of lands,
rendering lands unfit for beneficial uses. Management criteria include awareness and education, monitoring and containment of known infestations, and eradication where possible.

Purple loosestrife or lythrum (*Lythrum salicaria, L. virgatum*, and any hybrid crosses)
Dyers woad (*Isatis tinctoria*)
Tansy Ragwort (Senecio jacobea L.)
Meadow Hawkweed Complex (Hieracium prantense, H.)
Orange Hawkweed (Hieracium aurantiacum L)
Tamarisk "Salt cedar" (Tamarix spp.)

Category 3 Noxious Weeds

Consists of weeds that have not been detected in the state or may be found only in small, scattered, localized infestations. Management criteria include awareness and education, early
detection, and immediate action to eradicate infestations. These weeds are known pests in nearby states and are capable of rapid spread, rendering land unfit for beneficial uses.

Yellow starthistle (*Centaurea solstitialis*)
Common crupina (*Crupina vulgaris*)
Rush skeletonweed (*Chondrilla juncea*

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